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THE

Milroy Lectures

ON

MEAT INSPECTION,

WITH SPECIAL REFERENCE TO THE DEVELOPMENTS OF RECENT YEARS.

Delivered before the Royal College of Physicians of London

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LECTURE III.[1]

IMPORTED MEAT.

MR. PRESIDENT AND GENTLEMEN,—The annual amount of flesh meat consumed per head of the population was about 131 lb. in pre-war times; of this, 59 per cent. was home-killed and 41 per cent. imported. The division[2] of 126 lb. of this total shows that in the case of beef and veal 40·3 lb. was home killed and 23·3 lb. imported; in the case of mutton and lamb the respective figures were 15·7 and 12·7 lb., and for pork and pig products 19·9 and 14·0 lb. A comparison of the figures of the last ten years shows a tendency to increased consumption of mutton and lamb, in which the increase is mainly noted in the imported variety, and a definite reduction in the consumption of the flesh of the pig, the figures for 1900–03 showing a total consumption of 42·5 lb per head, against 33·9 lb. in 1912–13. The greater portion of this reduction was in the imported variety, the amount of which in the years stated declined from 21·5 lb. to 14·0 lb.

The increased consumption of imported meat has been in progress for many years, but the character of the supply has undergone a change. Prior to 1892 continental countries, chiefly Holland, Denmark, and Germany, imported largely both live cattle and sheep, and cattle were received from the United States in considerable numbers. The year of maximum importation was 1890, when 642,747 live cattle and 1,065,470 live sheep were imported. This is in marked contrast with the year 1913, when only 12,000 cattle and less than 1000 live sheep entered the country.

This decrease has resulted from orders prohibiting the importation of live animals for preventive reasons. Importations from the continent were forbidden in 1882, but for some time after this cattle were permitted to be landed for slaughter from the United States, Canada, and the Argentine. In 1900 the ports were closed to Argentine cattle, and to-day the landing of live cattle is regulated by the Foreign Animals Order of 1910, by which the landing of live animals is prohibited from the Argentine, Austria, Belgium, Bolivia, Brazil, Cape Colony, Chili, Columbia, Denmark, Ecuador, France, Germany, Gibraltar, Greece, British, Dutch, and French Guiana, Italy, Malta and Mexico, Natal, Paraguay, Portugal, Russia, Sweeden, Uruguay, and Venezuela. The landing of swine is also prohibited from the United States. Animals from countries not on the prohibited list may only be landed at Liverpool (Birkenhead), London (Deptford), Glasgow (Marklands), Bristol (Avonmouth), Cardiff (Bute Docks), and Manchester (Old Trafford).

In the United Kingdom the population during the decennium 1901–11 increased at a greater rate proportionately than did cattle and sheep, but at a lesser rate than did pigs. This fact, in association with the prohibitions mentioned, might have been serious had no other way of supplementing the supplies than by means of live animals been available. Discoveries, however, in connexion with the practical application of refrigeration to the meat industry proved the saving factor.

In 1861[3] freezing works had been established at Sydney, New South Wales, and at a luncheon on Sept. 2nd, 1875, the guests were served with meat which had been kept from the June of the previous year. In 1876 the *Northam*, a sailing ship fitted with freezing plant, attempted a trial shipment of frozen meat to England. The venture was a failure, as the ship never started on the voyage owing to mechanical difficulties arising. T. C. Eastman shipped the first consignment of chilled American beef to London in 1875, but various subsequent attempts to transport meat from Australia to London resulted in total failure or only partial success. The *Paraguay* successfully carried 80 tons of mutton from South America to Havre in 1878, and the s.s. *Strathleven* successfully carried 40 tons of beef and mutton from Australia to London in 1879. Since then progress has been rapid.

A summary table (XIII.) will indicate the amount of meat received from the chief exporting countries engaged in the trade. The figures given represent thousands of hundredweights.

TABLE XIII.

Year.	North America.	South America.	Australasia.	Europe.	Other countries.	Total.
1901	14,517	2171	2661	2470	0	21,819
1906	12,224	4511	2782	2621	0	22,138
1911	5,274	8913	4688	3476	24	22,375
1913	3,283	9640	5933	3965	10	22,831

Some idea of the actual class of meat imported and the different class of trades carried on by the various countries will best be seen from facts arranged in tabular form. In Table XIV. the totals are given in hundredweights for the year 1913, the information being obtained from official sources.

TABLE XIV.—*Amounts of Various Classes of Meat Imported from Different Countries in 1913.* (*The totals represent cwts.*)

Exporting country.	Beef.		Mutton.	Pork.		Hams.	Bacon.	Rabbits.	Preserved otherwise than by salting.	Unenumerated.
	Fresh or refrigerated.	Salted.		Fresh or refrigerated.	Salted.					
Australia	1,311,843	—	1,661,763	372	—	—	—	405,223	299,558	60,717
New Zealand ...	244,062		2,198,674	2,253	—	—	—	61,822	19,794	17,849
U.S.A.	932	35,609	—	12,014	36,896	732,961	1,742,689	—	87,802	82,128
Argentina	6,966,636	—	1,406,632	—	—	—	—	—	154,710	313,747
Netherlands ...	1,951	—	123,048	464,204	—	—	185,215	11,636	4,562	208,932

It is obvious that a trade in food intended for human consumption of such magnitude and presenting features distinct from the trade in home-killed meat would require special administrative measures to control it. The special features include the results of conveyance over long distances; the influence of diseases peculiar to the country of origin; the utilisation of scraps of meat and the exportation of small unrecognisable portions which cannot be submitted to satisfactory examination in this country; the exportation of meat from which the bones have been dissected to save cost of freight; the exportation of edible offal, and the character of meat which is canned or preserved in some other way before export.

These facts indicate that a special system was needed, and the exporting countries have generally recognised the necessity of supervising the meat before export to effect which they have instituted State inspections carried out by State appointed officials.

In this country the Foreign Meat Regulations were framed and put into operation on January 1st, 1909. Under these regulations foreign meat is classified into four groups—viz., Class 1 which includes (*a*) fresh, frozen or preserved meat which cannot be identified with parts of

[1] Lectures I. and II. were published in THE LANCET of August 4th (p. 147) and 18th (p. 225), 1917.

[2] Report of Board of Agriculture and Fisheries, Vol. XLVIII., Part IV. (Cd. 7551).

[3] A History of the Frozen Meat Trade. By J. Y. Critchett and J. Raymond. 1912.

a carcass, an exception being made in the case of meat made up into sausages or some other recognised food product; (*b*) tripe, tongue, and kidneys contained in certain specified preservatives; (*c*) severed parts of a pig, not bacon or ham, if not accompanied by an official certificate (this certificate has already been referred to); (*d*) severed parts of a pig in the form of bacon or ham if the lymphatic glands have been removed and if not accompanied by an official certificate; and (*e*) meat, whether from cattle or pigs, if it includes the ribs from which the pleura has been removed. Class 2 includes only the entire carcass of a pig imported without the head in the natural state of attachment, or from which the lymphatic glands have been removed. Class 3 includes meat in the form of severed parts of the carcass of a pig or other edible parts which does not comprise meat of Classes 1 or 2, and which is accompanied by an official certificate. "Unclassed meat" is any other foreign meat not included in Classes 1, 2, or 3. Of the above groups, the meat included in Classes 1 and 2 is not allowed to be discharged for sale in this country; meat of Class 3 is approved, subject to being satisfactory on general grounds; whilst "unclassed meat" is submitted to the ordinary routine of inspection.

Definite reference in these regulations is therefore made to scrap meat and unrecognisable cuts, certain edible offal, pig carcasses, and forequarter meat stripped of the pleural lining. The latter requires no further reference beyond stating that stripping of the pleura often means the removal of evidence of tuberculosis. The references to the pig merely ensure that the carcass shall have been examined prior to exportation and certified to be fit for human consumption in cases where the whole carcass is not available for examination in this country, and the prohibition of removal of head or glands prevents evidence of disease being removed before exportation. In the case of scrap and boneless meat a few additional observations are necessary.

BONELESS AND CANNED MEAT.

The least satisfactory part of the inspection of imported meat—i.e., satisfactory to the home inspector—is that relating to boneless meat and canned meat. Scrap meat and trimmings, which are now rightly excluded from importation, were formerly received in barrels or bags, and included neck meat and rib meat cut into small pieces. Boneless meat does not necessarily come within the category of scrap meat, for so long as it can be referred to a definite part of the carcass it is grouped as "unclassed meat." Ready and certain recognition of a joint has an important bearing on inspection, for unless an inspector can with certainty refer a piece of meat to a definite part of the carcass he is handicapped in his decision as to the matters to which his attention should be directed. He must have a mental image of the characteristics of normal meat from that area, remember the glands to be searched for, and know whether it is a piece which carries a serous membrane. This boned meat should, therefore, be cut in sufficiently large pieces to show definite anatomical relationship, there must be as little mutilation as possible in removing the bones, serous membranes must not be removed, and the glands of the part left *in situ* and, if possible, so positioned that they may be readily found. Attention must be paid also to the packing. They must be packed so as to retain as far as possible their normal shape without folding or rolling, and each piece should be frozen separately.

Granted that all these requirements are complied with, the position still remains unsatisfactory, and the fullest confidence requires to be placed in unknown inspectors. Meat so forwarded is generally from poor quality animals, no offal is available to assist the inspector, the general appearance presented by the carcass as a whole is lacking, and much has to be taken on trust. The majority of pieces are examined in the frozen state, as only a few may be thawed owing to the deterioration which follows the process even if re-frozen. A somewhat similar position confronts the inspector when examining tins of canned meat. Little more can be done than ascertain that the contents are sterile. Diseased conditions have occasionally been found by careful search of canned meat, but inspection for this purpose is not practicable. It is also more probable that a "plainer" class of meat and perhaps scraps, the importation of which is prohibited in the fresh state, may be used for canning.

For these reasons, and also to assist in other branches of the inspection of foreign meat, such as the oversight of the sanitary condition under which the different processes are conducted and to ensure that the regulations are observed, I consider that the Government should appoint expert inspectors to make periodical visits to the foreign abattoirs and food-preparation places from which food products are exported to this country. It is stated in the last report of the Chief Inspector of Foods to the Local Government Board that two inspectors of the Board have been lent to the Army to supervise the foreign canned meat supplied to the forces. A similar safeguard should be continued after the war in the interests of the civilian population.

GENERAL OBSERVATIONS RELATING TO IMPORTED CARCASS MEAT.

Carcasses arrive in this country either in the frozen or chilled state. Frozen meat has been submitted to a continuous temperature of about 15° F., and is therefore frozen solid. Chilled meat has been exposed to a temperature only 1° or 2° below freezing-point, and is therefore ready for sale immediately it is removed from the chilled room. It is not necessary to justify the statement that both chilled and frozen meat constitutes a satisfactory article of diet which is but little, if any, inferior to the home-killed variety either in the relative amount of nourishment it contains or in digestibility. It is possibly somewhat more digestible than the recently slaughtered home variety, since it has been satisfactorily proved that the maturation or ripening process slowly operates whilst the carcass is in the chilled condition and perhaps even whilst in the frozen.[4] The chief differences between home-killed and imported meat are due to physical changes the result of the process to which the meat is subjected. Apart from the details of dressing the carcass, chilled meat may differ very little from that of home-killed. It is more readily distinguished from frozen meat, but this distinction becomes progressively less if the temperature to which it has been exposed has been lower than 29° F. The fat of chilled meat often assumes a pinkish hue owing to staining with the meat juices, which compares with the yellowish-white colour of the fat of home-killed carcasses. There is also some roughening of the tissues due to the friction of transportation. The bundles of meat fibre assume a dull slate colour, and on section the meat shows some excess of moisture which is most apparent on pressure. These are really refinements of distinction, and it requires a very skilled person to state with certainty in some cases that a small joint is from a chilled carcass and not from a home-killed animal.

Frozen meat is more readily recognised. The carcass presents an unfinished appearance, the fat is dead-white in colour, rigid, and in varying degree rough and ragged. Unless previously thawed the outside of the carcass will be found covered with moisture condensed from the atmosphere. On section the muscular tissue will be found uniformly light in colour, which gives it a washed-out appearance. It is moister than either home-killed or chilled meat, and the extent of this exudation will depend upon the care displayed in thawing. The exposed surfaces of the sawn bones are white in frozen meat, whereas in chilled, if from young good quality animals, they may retain the rose-tinted appearance of home-killed animals.

The chief objections to these refrigerated carcasses are that the moist condition of the flesh and the previous process of maturation which they have undergone render them liable to putrefactive changes sooner than home-killed carcasses, and in the case of frozen meat that the thawing process unless satisfactorily performed results in the loss of much of the valuable meat juices.

The first of these objections is countered by ordinary methods of administration. The wholesale butcher keeps his supply in cold stores until he requires it for transmission to the retailer, and the retailer simply buys what he knows he can sell in the period during which the meat keeps in satisfactory condition or he may have a refrigerating chamber in which he keeps his stock, only bringing out his supply for sale as he requires it.

The loss of meat juices from frozen meat is of greater importance, but a knowledge of the circumstances which cause it will undoubtedly lessen the risk. It has been stated that in the process of freezing, the muscular fibres are lacerated by the ice spicules which form, and that on

[4] M. Muller: Zeitschrift für Fleisch- und Milch-Hygiene, 1903-4, p. 217.

thawing, the moisture which exudes is due to the escape of the liquid contents of the muscle fibres. This, however, does not appear to be the case. Richardson [5] has satisfactorily shown that the water freezes outside the cell and not inside. The ice thus formed occupies as much or more space than did the muscle fibres, and these as a consequence of the freezing process become isolated and distorted. If meat in this condition be quickly thawed, the fibres are not able to re-absorb the liquid as quickly as it reassumes the fluid state, and therefore it exudes from any cut surface. On the other hand, if the thawing is done slowly a considerable amount of the juice is reabsorbed and the extent of the moisture observed on the cut surface of a thawed joint depends upon the completeness or otherwise of this reabsorption. The rapidity of reabsorption depends to some extent on the temperature at which the meat has been carried. At very low temperatures considerable distortion of the fibres results and they do not so easily regain their shape as those which have been frozen at higher temperatures. The practical application of this fact is that meat carried at very low temperatures should be thawed much more slowly than that carried at higher temperatures.

This question of permanent damage to the muscular fibres is obviously of some importance, since loss of fluid means loss of valuable proteids, extractives, and salts. Fortunately there does not appear to be permanent damage, and, as suggested by Richardson, the process seems analogous to that which takes place when plants are frozen, in which case water freezes outside the cell in a state of considerable purity and not within. Such freezing does not necessarily kill the plant, especially if the subsequent thawing is slow. Experiments on animals would also indicate that the freezing of animal tissue does not necessarily result in serious damage to the cellular elements, or death would ensue in those cases where fish frozen in ice and submitted to a temperature of −15° C., and frogs frozen in ice, have regained their vitality on slowly thawing.

It follows, therefore, that the defrosting process should be conducted with due regard to the above requirements, and although many attempts have been made to devise mechanical means which would prove satisfactory, such as forcing air by means of a fan through the thawing rooms at progressively increasing temperatures, or the removal of frost and moisture by heated pipes, traders generally do not favour special means, since they take a few days to carry out and add to the cost of the meat. In the Nelson system the cold pipes of the ammonia expansion process provide a surface on which moisture is deposited, and steam pipes are used to generate the necessary warmth to thaw the carcasses. The steam pipes are placed under gratings in the floor and the cold pipes behind screens on the side walls. The space behind the screen is open above and below. Hot air rises between the carcasses, and a current is established which results in the warm moist air passing over the cold pipes. The moisture is deposited on the pipes in the form of snow, and the cold air falls to be re-warmed by the hot pipes and again rises between the carcasses. Meat thawed by this process is certainly dry and of good colour.

THE REGULATION OF COLD STORES.

In view of the fact that imported meat arrives in this country in shiploads, and that the supply is therefore often larger than that required for immediate sale, it is necessary for traders to provide themselves with cold stores in which the meat may be kept in condition until it is required for sale. The increase in the number of cold stores is a feature of the present-day wholesale meat trade. Many large retailers have also equipped themselves with this desirable accessory. In many instances the management of these stores leaves nothing to be desired; in others, however, considerable improvement could be effected.

Sanitary supervision is becoming increasingly a matter of importance. Dirt or unsuitable substances deposited in cold stores results in objectionable consequences just as surely as do similar conditions in premises devoted to the storage of fresh meat. The necessity for supervision is greater in public than in private stores. Public stores may be used on the basis of separate parcels being deposited and a change made varying with the bulk and nature of the goods brought in, or stores may be subdivided and larger or smaller compartments given over for private use by special arrangement. When many persons use a store there cannot be the same care displayed as when the stores are under single administration. The common use of stores does not tend to improve either cleanliness or the maintenance of regular temperatures.

Cold stores should be well lighted by electric means; not only for supervision, but to enable work to be done under the best conditions. Some differentiation of goods deposited is also necessary. Mixed goods such as poultry, eggs, fish, cheese, and the like should not be placed in compartments containing meat, and in meat stores the drier carcasses should be separate from the moister offal. Provision should be made for adequate drainage or for frequent removal of offal drainage.

Goods which are deposited in the stores should be in such a state that they are fit for refrigeration. Putrefaction is considerably masked by freezing, and no goods except absolutely fresh material free from any mustiness should be admitted. In addition, the removal of frozen goods for sale and the consequent thawing should be sufficient to justify objection being taken to the readmission of such goods with only rare exceptions. This matter of admission of products into stores, and the fact that freezing masks decomposition, demand that definite responsibility shall devolve upon someone to ensure that stores are used in a proper manner, and to safeguard the public against cold stores being used to help in getting rid of products which are in an unsatisfactory condition. How far responsibility attaches at present to other than the owner of unsound goods so deposited is not clear, but in public stores in which odd products are deposited it seems reasonable to require that the proprietors should be equally responsible with the owner of the goods as regards their condition, and where separate compartments are reserved the sub-tenant should be responsible for his own goods, and likewise be joined in any responsibility which may devolve upon an owner to whom he grants facilities to store goods in his compartment.

It would much help local authorities if definite regulations were framed dealing with these and other matters, and perhaps annual registration of ownership of cold stores, with submitted lists of sub-tenants in places where compartments are hired, would prove of service. Registers should be kept of the date of all goods admitted and discharged, and such should be available for inspection by the sanitary authority. In certain of the United States a time-limit is placed by law on the period during which goods may remain in cold stores. In certain instances provision is made for extension of the time, in others the period is absolute. In some States, also, all goods are required to be stamped with the date of admission. In the present position of our knowledge it is impossible to fix a period beyond which retention in store should justify destruction and which would operate equitably all round. As regards stamping the goods, there is perhaps something more to be said in favour, but it cannot serve any very practical purpose; probably the fact that it would indicate that goods were deposited in season is the best reason. A register of admissions and discharges would meet most of the sanitary requirements and present no administrative difficulty. Free admission to the stores and to the different compartments and passages should at all times be granted to authorised sanitary officers.

THE INSPECTION OF IMPORTED CARCASS MEAT.

As in the case of imported edible offal and boneless meat, inspection as to "condition" is a more essential requirement in the case of carcass meat than is the subject of disease. By condition is meant not the qualities which the breeder considers when deciding whether an animal is fit for slaughter, but the condition of the meat on arrival in this country. It is obvious that if the temperature to which the meat is exposed has been allowed to rise above a point at which decomposition changes may take place, the meat may be rendered either wholly or in part unfit for human consumption. Condition in this sense is not easily recognised whilst carcasses are in the frozen state, but indications that all is not well may be gathered from the state of the covers when the cargo is being discharged. A kind of muslin cover is placed over frozen carcasses after they are frozen, in which condition the carcasses are dry. It follows, therefore, that if no thawing afterwards takes place there will be a minimum of staining by blood juices of these covers, and they will be

[5] The Cold Storage of Beef and Poultry. By W. D. Richardson, chairman, Chicago Section American Chemical Society. First International Congress of Refrigeration.

practically non-adherent, which would not be the case if re-freezing has followed thawing. At the port of entry it is impracticable to examine every carcass, but in any particular consignment a breakdown will probably affect a considerable proportion of all carcasses, so that an examination of, say, 10 per cent. will give a reliable indication as to the condition of the whole. The question of disease generally arises when the carcass is being cut up either in the wholesale market or in butchers' shops.

Breakdowns in machinery will always occur, but with improvements in refrigeration plant and the special equipment of vessels for meat transportation these are becoming less frequent.

In the earlier days of the trade much difficulty was experienced from the formation on carcasses of moulds. These deposits were of various kinds, some being the usual superficial growths of mucor or penicillium, whilst others formed in the superficial tissue in the form of spots of various colours belonging to the saccharomyces and oidium and other groups. To some extent there is a relation between temperature and their formation, since moulds are known to grow at temperatures round about freezing point; moulds and defective condition are, therefore, not infrequently associated. Moulds, however, will not develop without original contamination, and this problem has been almost solved by rigid attention to elementary cleanliness in the slaughtering places, the chill rooms, the holds of ships, the transporting vans, and the cloths which enclose the carcasses and the cleanliness of those who handle the meat; and in the case of offal, improvements in the method of packing.

To effect surface disinfection of meat the Linley process was invented. This consists of a method whereby air charged with formalin vapour is passed into the freezing or chilling room. After remaining for a time the formalin is replaced by cold air which has been dried by passing over calcium chloride and purified by being forced over zinc plates moistened with sulphuric acid. In the early days of this process exception was taken to the use of formaldehyde vapour owing to the fact that it could be shown that formaldehyde penetrates into meat so treated to varying depths. In the first 5 mm. of muscular tissue unprotected by fat it was found to the amount of 1 in 3500 and in the second 5 mm. to 1 in 10,000. Dr. G. S. Buchanan,[6] reporting on the subject, suggested that importers and traders concerned should consider whether the disinfection by formaldehyde should not be limited to the disinfection of the hold before the introduction of the meat.

The process is now used somewhat differently from what was then the practice. The chilling room at the place of slaughter is filled with the carcasses of that day's killing, generally to the number of 125 to 155. The temperature of the chamber before commencing to fill is brought down to 42° F. It rises during filling to from 50° to 65°. This is reduced to the chilling temperature, i.e., somewhat below 32° F., in from 28 to 36 hours. Formalin vapour is introduced into the chill-room at the higher temperature, and the meat is left exposed to it for from 40 minutes to one hour. No refrigeration takes place in this interval. The cold-air circulation is then set in operation, and dried and cleaned air is then passed through the chamber. The meat is held up in the chill-room until the time comes for exportation, and dried and cleaned air is afterwards passed through the chamber for 30 minutes every 24 hours. Originally the holds on the steamers were formalised, but that is not now the case. The chill-rooms on the steamer are filled with carcasses, and afterwards only the dry clean air is passed through for periods of 30 minutes every day. Formerly one ounce of 40 per cent. formaldehyde to every 100 cubic feet of atmosphere was vaporised, but now the amount is 1 to 300.

BONE TAINT.

A subject which may properly be referred to under "condition" is the objectionable defect known as bone taint. Although not so frequently met with as formerly, it is still a cause of condemnation of imported carcasses. On occasions quite a considerable number of quarters so affected are discovered, but fairly lengthy periods may elapse during which only odd instances are noted.

This defect is characterised by deep-seated putrefactive changes in the thick muscles in the neighbourhood of the hip- and shoulder-joints, chiefly the former. There are no external appearances which would suggest the presence of putrefaction, and it is most frequently observed in the primest animals, and particularly in those slaughtered during the summer months. The condition is found on sectioning the carcass or by exploring with a skewer in chilled and an augur and bit in frozen carcasses.

The cause has been variously assigned to putrefaction of the joint-oil, the conveyance of organisms by the blood during life, the retention of animal heat, &c. My own observations lead me to the conclusion that the condition is often due to the insuction of putrefactive micro-organisms into the large blood-vessels at the time of dressing the carcass. That excessive fatigue may be a cause of bone taint has long been recognised. It appears undoubted that the usually sterile blood may contain organisms in certain circumstances. This happens after excessive fatigue. In such cases organisms capable of giving rise to offensive putrefaction may exist in the blood-vessels at the time of slaughter, and taint might therefore arise in those situations where the animal heat is maintained for a sufficiently long period. Those cases of bone taint, however, to which reference is here made, appear more likely to result from external contamination as suggested. The inherent animal heat is sufficient to maintain the vitality of such organisms for several days, and the desirable temperature is continued for a longer period in animals which are in the primest condition and show the thickest layer of fat. Summer heat helps, inasmuch as there are probably more of these organisms air borne in summer than in other months, and perhaps because in the preliminary few hours wait of the carcasses for chilling the heat does not leave the carcass so rapidly as in colder months.

Examination of the large arteries in the affected part shows that the internal lining membrane is foul and discoloured for a length of three inches or more in the deepest parts of the joint, and I have seen as many as three centres on the same side. The veins do not show the change, or if so only in lesser degree. Once putrefactive organisms are deposited within the artery they continue to develop until checked by the cold, and the offensiveness thus generated appears to be retained and only released on cutting into the part. Dr. Andrewes, bacteriologist for the City of London, who has examined these dissected specimens bacteriologically, reports the presence of several organisms. In one case he found *Proteus zenkeri* and forms of *Bacillus coli* (not *communis*) and *B. lactis aerogenes*. There were no anaerobic organisms detected. The lining membrane of the artery contained an abundance of these organisms. The surrounding tissue contained similar organisms except that the proteus was absent and the numbers of those found were much more sparse than in the arteries. In other cases flesh from the offensive area was found practically free from organisms and the hip-joint contents were sterile.

It is not difficult to see how organisms may reach the deeper blood-vessels. By the act of bleeding the arteries are emptied of blood and reflex contractions of the muscles submit them to compression. On relaxation of the pressure the elastic arteries dilate and air containing organisms will be sucked in. When the main arteries are divided in the pelvis at the time of dressing only a few inches separate the cut end from the localities where the putrefaction arises. As it takes several days for carcases to freeze completely or even to chill thoroughly in the deeper parts there is ample time for development to take place in the deep parts of these carcasses, particularly in those containing the thickest amount of tissue.

The condition as stated is not now so frequently observed as formerly, but if it is desired to eliminate the defect completely ligature of the artery before division, which division should be on the aorta side of the ligature, would probably prove effective and would not be difficult to arrange.

ORANGE-COLOURED STREAKS IN THE FAT OF IMPORTED CARCASSES.

A physiological condition which, therefore, cannot be described under either "condition" or "disease" is met with in certain imported carcasses. It is characterised by

[6] Reports to the Local Government Board, by Dr. G. S. Buchanan and Dr. S. B. Schryver, D.Sc., on the Application of Formaldehyde to Meat (Food Reports, No. 9).

the presence of well defined orange-coloured streaks in the fat surrounding the kidneys and in the fat of other parts where it is deposited in considerable amount. A similar condition I have occasionally observed in home-killed animals, but whether it affects home-killed or imported animals it is only found in the fattest and best-conditioned. The defect has not been regarded as one which will cause harm to human beings, but it is of such a pronounced character in some cases that it renders the fat unmarketable.

Dr. Andrewes investigated the condition in the fat removed from a home-killed animal. It is probable that the following facts which he established would apply equally to the defect observed in imported carcasses. The change appears to occur along the small blood-vessels, which accounts for the veined appearance of the orange-coloured marking. The fat in the affected area is largely split up with formation of abundant needle-shaped crystals of fatty acids. These do not stain with iodine, and are hence a saturated fatty acid, probably stearic acid. Such a change must be brought about by a fat-splitting ferment, which from the distribution of the change is probably conveyed by the blood. It has been proved by Abderhalden that when animals receive a diet containing fat in excess, such a fat-splitting ferment becomes actually demonstrable in the blood. It is therefore possible that in fattened animals a sufficient amount of the ferment is present in the blood at death to give rise to local fat-splitting around the blood-vessels. Mr. Mackenzie Wallis, on Dr. Andrewes's staff, examined the pigment of the yellow areas, which he found could be readily extracted with petroleum ether, to some extent with ether, but not by alcohol. The solution gave the spectrum of a lipochrome. There were no bands suggesting derivation from hæmoglobin, nor was there any evidence of hæmatoidin or any blood derivative. It could not be determined whether the pigmentation was due to a concentration of the natural lipochrome of the fat or to lipochrome brought by the blood stream.

The conclusion to be drawn from the above is that animals may be "over-conditioned," with consequent loss to the salesman owing to the unmarketable characteristics which are acquired by considerable quantities of valuable fat.

THE DISEASES OF IMPORTED CARCASSES.

The diseases to which foreign cattle are subject differ in many respects from those observed in this country, and although it would not be possible here to enter fully into any detailed description, it may be of service to direct attention to the main features. In general it may be stated that diseased carcasses are eliminated from those exported, and to this extent a word of appreciation of this branch of inspection as conducted in exporting countries is not out of place.

The chief exporting countries and the class of product exported have already been described, and the chief affections met with are:—

Australia: Onchocerciasis in cattle.

Argentina: Actinomycosis in ox tongues and a number of instances of tuberculosis.

Holland: Tuberculosis and hæmorrhagic lesions in pigs.

Russia: Foot and mouth disease was noted in a number of dried tongues imported in 1913.

Sweden: This country before the war exported many calves, but no exceptional incidence of disease was noted.

Cases of caseous lymphadenitis are occasionally met with in sheep from different countries.

Organs occasionally show evidence of the usual parasitic diseases and other conditions which may have escaped detection during inspection.

Onchocerciasis, which results from invasion of cattle by the parasitic worm *Onchocerca gibsoni*, has been dealt with administratively on the following lines. The brisket, in which joint are chiefly located what are termed the worm nests characteristic of this disease, is cut off all Australian carcasses exported to this country, and the region of the stifle-joint is explored by suitable incisions for the presence of the nodules. These mutilations of sides of frozen meat are sufficient to distinguish Australian meat from all other, and are carried out by arrangement between this country and Australia. The only difficulty which now arises is that the briskets are occasionally cut too short, with the result that the worm nests may be found on the forequarter in the neighbourhood of the incision. This is an infrequent occurrence, and is generally the result of some easily remedied inspectorial difficulty.

The loss to Australian cattle-breeders must be considerable from this cause, and research work is in progress with the object of devising suitable preventive measures. The present position of knowledge[7] appears to be that by means of a biting insect, either *Stomoxys calcitrans* or *Culicelsa vigilax*, embryos are taken up from the bovine host. In the insect a certain stage of development takes place, and eventually the partly developed worm or worms are injected into the subcutaneous tissue of the new bovine host. Having been injected, the worms increase in size and start on their migrations. From the lower part of the leg they reach the front of the knees, and from the fore-limb they reach the brisket area. Living embryos are deposited and by means of toxic products cause a certain amount of swelling which leads eventually to some degree of fibrosis. When the adult worm is arrested embryos continue to be released, and the reaction results in the encapsulation of the worm in the fibrous mass which is noted in meat-inspection work. The embryos in the early stage, or even after encapsulation, may escape and reach situations where they may be taken up by a biting fly.

As regards Argentine animals, the following particulars (Table XV.) given to Mr. Young, veterinary surgeon of the City Corporation, indicate the prevalent diseases and their frequency. (The figures relate to the year 1912.)

TABLE XV.

—	Cattle.	Pigs.	Sheep.
Total number slaughtered	1,368,000	8922	3,217,367
Tuberculosis...	4%	19·3%	—
Echinococcus veterinorum	25%	—	28·3%
Distomatosis...	—	—	2·4%
Actino-bacillus	6407	—	—
Jaundice	1467	—	1713
Trichinosis	—	2·5%	—
Cysticercus cellulosæ	—	0·3%	—
Caseous lymphadenitis	—	—	3·6%

Actinomycosis.—The presence of actinomycosis in Argentine ox-tongues has been reported on both by the officers of the corporations of Liverpool and London. In London the condition is still noted, but not so frequently as two years ago, and the diseased tongues which are now observed are generally only slightly affected. The condition has been recently investigated by Dr. Griffith,[8] of the Local Government Board, who considers, in a preliminary report, that the bacillus of Lignières and Spitz is responsible for the Argentine cases. He also found that 40 out of 44 English cases were caused by the same bacillus. As actinomycosis is a disease to which human beings are liable, this condition requires further investigation, and the prohibition should meanwhile be continued against the importation of tongues so infected.

The condition in ox-tongues chiefly affects the retro-pharyngeal glands, more rarely the blades. In the early stages the glands may not even be enlarged, but section shows the glandular elements to contain several prominent points resembling granulation tissue. In more advanced cases the glands are enlarged and filled with yellowish semi-purulent material containing sand-like gritty bodies. The disease may be mistaken for tuberculosis with which the Liverpool researches indicate it is frequently associated. A few years ago the percentage of affected tongues imported into London varied in different consignments between 5 and 20 per cent.

Hæmorrhagic flesh.—The hæmorrhagic condition observed in pigs imported from Holland is apparently not the result of disease, and is probably of similar origin to the corresponding condition occasionally observed in pigs, and sometimes in cattle, slaughtered in this country. Punctate or even larger hæmorrhages in the muscular tissue of the diaphragmatic and abdominal muscles are seen in animals which are obviously in sound condition. These appear to be due to the laceration of the muscular elements and capillaries by the muscular contractions which follow stunning, particularly when several are stunned at a time and some little interval elapses before they are bled. The condition is objectionable if very extensive, since the number of hæmorrhagic points renders the flesh unsightly and may encourage premature decomposition. If the condition is of limited

[7] Further Investigations into the Etiology of Worm Nests in Cattle due to *Onchocerca gibsoni*. By J. Burton Clelain, M.D., Ch.M. Sydney. Commonwealth of Australia. 1914.

[8] Preliminary Report on the Pathology of Bovine Actinomycosis, by Fred. Griffith, M.B., Local Government Board. Food Reports No. 23.

extent the affected part may be removed and destroyed, but if extensive condemnation of the carcass is called for.

Berger[9] has investigated this subject and reports having observed in the situations stated hæmorrhages of a length of from a few millimetres to 2 centimetres with an average width of 2 millimetres. Berger had control of two establishments at which pigs were slaughtered and made the following observations:—

In abattoir A, previous to May 1st, 1909, the pigs were slaughtered with the mallet in batches of 20 at a time, each pig receiving a blow with the mallet, but it was not till the whole 20 had been thus stunned that bleeding was practised. Moreover, the animals were not bled in accordance with the order in which they were stunned. While this method was followed the hæmorrhages under consideration were very abundant at this abattoir, 2 per cent. of the pigs showing them.

In abattoir B the pigs for a long time had been killed by the American method—viz., the animal being suspended in the air by the hind-limbs and bled immediately without stunning, with the head hanging downwards. In about 140,000 pigs killed in this fashion Berger never observed the hæmorrhages.

Previous stunning was then introduced into this abattoir, and from the day of its introduction the hæmorrhages commenced to appear.

The author thinks, therefore, that the hæmorrhages may be attributed to the stunning. He has attempted to find out whether the exact method of stunning adopted exercises any influence, and he has been informed that the hæmorrhages have not been observed in abattoirs where special apparatus (the bullet, percussion, &c.) are employed. In Germany, where pigs are generally stunned by a blow from the mallet, hæmorrhages are encountered in 25 per cent. of those killed.

In abattoirs it often happens that, no order being followed, the first pigs to be stunned in a batch are the last to be bled. In Abattoir A, therefore, it was arranged that no more than six pigs were to be stunned at a time before bleeding, and when this was done, it was quickly found that muscular hæmorrhages diminished.

Berger then directed that the pigs should be bled immediately after stunning, and while previous to this he had found hæmorrhages in 2 per cent. of the animals killed, he has since, up to the present time, inspected 5000 pigs without finding one case. Ruptures of the muscular fibres, however, are still observed, but as the pigs are bled immediately, the blood has little time to become extravasated into these ruptures.

It is evident, nevertheless, that hæmorrhages may be produced a certain time before slaughter by the different traumatisms in which the pigs may be exposed.

Foot-and-mouth disease was noted as affecting several consignments of smoked tongues received in London prior to the war. They arrived from a district in which the disease was endemic, and it was observed that the lesions varied from the early vesicular stage to healed cicatrices. A separate inspection of all tongues was called for and a decision arrived at that in future, consignments showing such lesions would be refused admission, as the duty of controlling such imported food rested with the authorities of the country of origin.

THE HANDLING OF MEAT.

The handling of meat is a subject which affects both the distribution of home-killed and imported products. It is a matter to which attention has been often directed in the past, but no permanent improvement has so far been effected. The transportation of imported meat from the ships to the cold stores and thence to the market compares favourably with that of home-killed produce, but the transference of meat of either class from the market to butchers' shops often leaves much to be desired.

Many persons in country districts who slaughter only small amounts send the meat to market by passenger train, and it often happens that sufficient attention is not paid to the packing. The same observation applies to meat sent to country shops. Defective packing encourages decomposition, and inadequate covering renders the meat liable to contamination in transit.

After the purchase of meat at the wholesale market has been completed subsequent care becomes the responsibility of the purchaser. Porters are generally engaged to perform the manual labour of conveying the meat from the stall to the carts which convey it to the retailers' premises. A porter carries meat on his back, and when large parts are transferred it often rests on his head. In addition to the requirement that porters should frequently change their overalls, they ought also to be required to wear a washable head-covering.

On arrival of meat at the carts it should not be placed at the ground level, even if on low wooden supports, prior to being packed in the cart; neither should trucks conveying meat be allowed to stand in public ways uncovered where the cut section of meat may collect dust and dirt.

Carts designed for any purpose except the satisfactory conveyance of meat are used. Even when clean, unsatisfactory construction causes dirt to be left in places from which it cannot easily be removed.

Coarse brown sacking is the most frequent covering I have seen used to enclose meat. It is difficult to see when it is soiled, and as a consequence it is not scalded after each time of use. White washable cloths are the exception.

The bottom and sides of the cart are either covered with sacking or else with a layer of straw. In some instances the straw is below the sacking, but by no means usually. Straw is a most unsatisfactory medium on which to place the cut sections of meat.

The meat is packed in the cart without satisfactory regard being paid to the danger of street dirt being conveyed to the meat. If a white cover were laid on the bottom of the cart it could be rolled up as far as necessary whilst a part of the van is being packed and unrolled gradually as filling proceeds, thus covering the feet-marks of the man who must be in the cart. Other products are often packed with the meat. Boxes of rabbits and boxes containing various materials can often be seen either resting on the meat or supporting it. The fur of the rabbits projects through the latticed wooden cover of the box and is often in contact with the meat. It is impossible to state with what wooden boxes from abroad have been in contact, and so one might enlarge upon this point.

Tarpaulins are used for the outside cover, and these are often far from clean and sometimes come into contact with the produce, which should be avoided.

Drivers are not careful; some may be seen driving through the streets sitting on the meat. The vans are not always completely covered. Any day in different parts of London meat-vans may be seen with a great superficial area of meat exposed to the dust and dirt both at the front and back.

It should be noted as emphasising these points that the meat is often not in the form of sides but has been cut across, leaving large moist sections of meat exposed. These surfaces should be covered with grease-proof paper and more use made of cloth coverings both for joints and for sides of beef. In the slaughter-houses due regard requires to be paid to the observance of cleanliness; in the markets the traders vie with one another in matters of order and cleanliness, and in the shops retailers recognise the value of brightness and prove it by good lighting, clean benches, bright brass and steel fittings, and clean-looking tiles; but in the interval between purchase from the wholesale dealer and the reception of the meat at the shop there is this remarkable apathy displayed by some as regards observance of elementary rules.

Although no ill-results are reported as a direct consequence of present methods—for which perhaps we have to thank the cooking process to which meat is subsequently subjected—they offend sentiment and should be improved upon. It is difficult to suggest any official action which can be taken at the present time, since no specific regulation is ignored and the negligence arises in what may be regarded as "no man's land." Inside the markets control is possible and is exercised, and meat is handled on many stalls in a manner which is worthy of commendation. The difficulty chiefly arises outside. The chief hope of immediate improvement rests with the butchers. Those who recognise their responsibilities in this connexion should bring pressure to bear through their trade organisation on their less careful associates, and as a future direct effect it may be possible, if regulations are subsequently framed to control meat inspection, for the requirement that food shall be handled in a cleanly manner to be incorporated in the series.

CONCLUSIONS.

In conclusion, I need not say more than repeat the requirements which appear to me to be necessary to put meat inspection on a more satisfactory basis.

[9] Veterinary Record, Sept. 30th, 1911, Muscular Hæmorrhage in the Muscles of the Pig.

1. With a view to ensuring uniformity of action *routine* meat inspection should be made a compulsory duty of all urban sanitary authorities.

2. With a view to safeguarding more adequately the supply in urban districts there should be compulsory inspection of those slaughter-houses in rural districts at which carcasses are dressed for sale in outside areas.

3. Inspectors engaged on meat-inspection work should be required to possess proof of knowledge of the subject.

4. Regulations should be framed dealing not only with the details of inspection of carcasses but with the sanitary requirements of slaughter-houses, facilities for inspection, and perhaps the requirements of ante-mortem examinations.

5. A system of meat marking under the direct control of the Local Government Board should be instituted, and as a commencement its adoption should be voluntary, but permission to adopt should be within the power of the Board to grant or to refuse.

6. In districts where a system of meat-marking is in operation the local authority should have power to require that all meat used in prepared food products should be inspected and approved before being used.

7. In view of the impossibility of satisfactorily examining in this country imported boned meat and meat in the canned form, some of the responsibility which now devolves upon home inspectors should be accepted by the Government, who should appoint inspectors to visit the chief places abroad where the work of boning, canning, and exporting meat generally is carried out. In this way attention could be given to the observance of hygienic requirements and to the quality and character of the meat used.

8. Regulations should be framed to control cold stores in which food products of any kind are stored.

9. Regulations should be framed to ensure that meat is handled in a cleanly manner.

THE PHYSIOLOGICAL AND ANTISEPTIC ACTION OF FLAVINE

(WITH SOME OBSERVATIONS ON THE TESTING OF ANTISEPTICS).

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FLAVINE, or acriflavine, has been much in evidence recently, and it has been claimed for it that it approaches the ideal antiseptic in that it has no deleterious effect on the tissues and that the antiseptic power is increased by admixture with serum. Browning and his co-workers[1] have published a table giving the antiseptic values and the influence on phagocytosis of a number of antiseptic solutions, and they arrange them in order of merit by means of a "therapeutic coefficient," which they define as the ratio of the antiseptic power in serum to the power of inhibiting phagocytosis. The latter is used as an index of the "general toxicity to living matter." They claim for flavine that it has a very high antiseptic value for the common organisms found in wounds, and that in the strength they apply it (1 in 1000) it is practically without harmful effect on the tissues as measured by its action on leucocytes.

This antiseptic has been introduced into practice purely as the result of laboratory experiments, and thus it would be well to make sure that these are without flaw before drawing deductions as to its clinical value.

I propose to set forth in this article the result of some experiments I have made with flavine, which show that the claims which have been made that this substance approaches the ideal antiseptic are based on fallacious experiments, and that by altering the experimental conditions slightly the "therapeutic coefficient" can be altered to an enormous extent. I will show also that the action of flavine on living tissues (as exemplified by leucocytes) is far in excess of its lethal action on bacteria.

The flavine used in these experiments was supplied by the Medical Research Committee and has been tested at the Bland-Sutton Institute to "ensure its being free from toxicity to human tissues and as efficacious in the control of bacterial infections as the sample with which the preliminary experiments and trials were conducted."

PART I.—*Action of Flavine on Human Blood.*

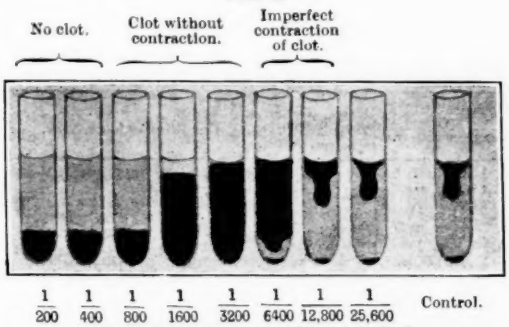
(*a*) *On the red corpuscles.*—There is very marked agglutination of human red corpuscles up to a dilution of flavine of 1 in 3200. A dilution of 1 in 6400 showed only slight agglutination and the higher dilutions showed none at all. This would only be of importance if flavine were used as an intravenous injection, but I hope to produce evidence later that flavine is useless as a therapeutic agent by the intravenous route, so this point need not be further discussed.

(*b*) *On the clotting power of the blood.*

Experiment 1.—My own blood mixed with an equal volume of normal salt solution clotted in 2½ minutes at 37° C. Under the same conditions my blood mixed with an equal volume of flavine (1 in 1000 in normal salt solution) failed to clot in 60 minutes.

Experiment 2.—One volume of each of a series of progressive dilutions of flavine were mixed with an equal volume of my blood in small test-tubes and incubated at 37° C. for three hours. The results are shown in Fig. 1, from which it can be seen that 1 in 400 flavine has

FIG. 1.



Effect of flavine on coagulation of blood.

completely inhibited clotting; 1 in 800 had formed a very light clot after the agglutinated corpuscles had sedimented; 1 in 1600 and 1 in 3200 showed loose clots, and here the sedimentation had not proceeded so far before clotting had occurred; 1 in 6400 was the first dilution in which any contraction of the clot was observed; and even in 1 in 12,800 there was shown some deficiency in the contraction of the clot.

It is very difficult to estimate the importance of this inhibitory power on the coagulation of the blood. Sir Almroth Wright has for many years combined with his hypertonic salt solution some citrate of soda to prevent clotting of the lymph in a wound and flavine may be beneficial in this way. This action of flavine, however, must be borne in mind when it is applied to freshly incised wounds which may be oozing and where the inhibitory action on clotting would allow this oozing to continue. Probably the flavine would soon be diluted below the point at which it has any action, but even then the result would be an excessive amount of blood clot which might furnish a nidus for bacterial growth.

(*c*) *Action of flavine on the leucocytes.*—Browning and his co-workers measured the toxic effect of flavine and other antiseptics on the leucocytes by introducing these substances as a fourth volume in an ordinary opsonic mixture and estimating the amount of phagocytosis which had taken place in 20 minutes. A more direct method is to observe the effect of the antiseptic directly on the movements of the leucocytes. Sir Almroth Wright[2] has given us a simple method of observing the emigration of leucocytes, and this method I have used except that instead of blowing out the clots and staining them I have examined them directly at intervals *in situ*.

Experiment 3.—Serial dilutions of flavine are made in normal salt solution, and to each of these dilutions is added an equal volume of blood from the finger. They are rapidly mixed, drawn into Wright's emigration tubes, sealed at one end, and centrifuged before the blood has clotted. After this the tubes are closed and arranged in order on a microscope slide, being kept in place by plasticine. They are then incubated at 37° C., with the portion of the tubes containing the red blood corpuscles downwards, so that any leucocytic emigration into the white clot has to be against gravity. After intervals of one, three, and six hours the tubes are examined with a 2 3-inch or a 1/6-inch objective and the amount of emigration noted.

Using this method I find constantly that a 1 in 2000 dilution of flavine completely inhibits the emigration of the leucocytes, while a 1 in 4000 dilution shows a partial

[1] Browning, Kennaway, Gulbransen, and Thornton: Brit. Med. Jour., Jan. 20th, 1917.

[2] Wright: THE LANCET, April 17th, 1915.

inhibition. In dilutions weaker than this the leucocytes have emigrated through a distance corresponding to three or four fields of a 1/6-inch objective as they have done in the control without flavine,[3] but in the tubes containing flavine up to a dilution of 1 in 64,000 (the highest dilution observed) the leucocytes appear as rounded bodies in marked contrast to those in the control tube which present a very irregular appearance and show active amœboid movements. In all the flavine dilutions also the leucocytes take up the stain and show a much deeper yellow colour than does the surrounding fluid.

This attraction of the leucocytes for the dye and the absence of amœboid movement naturally lead to the question, "Are these leucocytes in the flavine dilutions dead?" To test this I estimated the phagocytic power of leucocytes after exposure to various strengths of flavine.

Experiment 4.—Serial dilutions of flavine were made in normal salt solution from 1 in 500 to 1 in 32,000. To 0·5 c.c. of each of these dilutions was added 0·5 c.c. of defibrinated human blood. These were mixed and incubated at 37° C. A control tube was also made with equal volumes of defibrinated blood and normal salt solution. After five hours' incubation the tubes were shaken and with capillary pipettes two volumes of the contents of each tube were mixed with one volume of staphylococcus emulsion, incubated for 15 minutes at 37° C. and then proceeded with as in the estimation of the opsonic index. The cocci contained in 100 cells were enumerated (where 100 recognisable cells could be found). The results are shown on Table I.:—

TABLE I.—*Phagocytic Power of Leucocytes after Exposure to Flavine for Five Hours.*

Flavine concentration.	No. of cocci in 100 cells.	Condition of leucocytes.
1 in 1,000	0	Broken up and hardly recognisable.
1 ,, 2,000	0	,, ,, ,,
1 ,, 4,000	0	Mostly destroyed. A few stain well.
1 ,, 8,000	0	,, ,, ,,
1 ,, 16,000	25	Much disintegrated.
1 ,, 32,000	59	,, ,,
1 ,, 64,000	128	,, ,,
Control.	920	Normal appearance.

Experiment 5.—The previous experiment was repeated except that the flavine dilutions were made in defibrinated blood from a 1 in 1000 saline solution of flavine. To 0·5 c.c. of each of these dilutions was added 0·5 c.c. of defibrinated blood. Samples were tested, as in the previous experiment, after 5 hours and again after 24 hours. The results are shown on Table II.:—

TABLE II.—*Phagocytic Power of Leucocytes after Exposure to Flavine Dissolved in Blood.*

1. *After 5 hours.*

Flavine concentration.	Cocci in 100 cells.	Condition of leucocytes.
1 in 2,000	0	Hardly recognisable as cells.
1 ,, 4,000	0	,, ,, ,,
1 ,, 8,000	0	One or two with nuclei still visible.
1 ,, 16,000	0	,, ,, ,,
1 ,, 32,000	5*	Either broken up or pycnotic.
1 ,, 64,000	7	,, ,, ,,
1 ,, 128,000	49	,, ,, ,,
1 ,, 256,000	53	,, ,, ,,
1 ,, 500,000	200	Many broken up but some stain normally
1 ,, 1,000,000	192	,, ,, ,,
1 ,, 2,000,000	320	In good condition.
Control.	372	,, ,,

* In 1 cell.

2. *After 24 hours.*—The cells in all the dilutions up to 1 in 2,000,000 were much broken up, and none of them showed any phagocytosis, although in the control tube the leucocytes stained well, and nearly all of them contained ingested cocci.

An experiment similar to Experiment 5 was done substituting carbolic acid for flavine and it was found that a 1 in 2000 dilution only partially destroyed the functions of the leucocytes in 24 hours.

We see from these experiments that flavine, if allowed to act for some hours, has a very powerful leucocidal action and that even a 1 in 2,000,000 dilution will completely destroy all the leucocytes in 24 hours. The leucocidal action, also, is more marked in Experiment 5, in which flavine was acting in a greater concentration of serum, than in Experiment 4, in which equal parts of a saline solution and blood were employed. This indicates that possibly the leucocidal action of flavine is enhanced by combination with serum in the same way as is bactericidal action. The lethal effect of flavine on leucocytes is, as we shall see later, much greater than its bactericidal action.

The importance of the time factor in regard to the estimation of the toxicity of flavine on the leucocytes will be further discussed in connexion with the "therapeutic coefficient."

[3] In this method the leucocytes do not after three hours appear to wander farther away from the red clot when they have no special stimulus attracting them.

PART II.—*Antiseptic Action of Flavine.*

Browning and his co-workers have given the following figures for the antibacterial power of flavine:—

Medium.	Organism.	Lethal concentration of flavine.
Peptone water	Staphylococcus.	1 in 20,000
Serum	,,	1 ,, 200,000
Peptone water	*B. coli.*	1 ,, 1,300
Serum	,,	1 ,, 100,000
Blood	Staphylococcus.	1 ,, 40,000
Pus	Staphylococcus and streptococcus.	1 ,, 2,000

The following experiments will bring out clearly, among other things, that the high antiseptic values for flavine in serum can only be obtained in special conditions, and do not give us a clear indication as to the value of this antiseptic as an application to wounds.

Does the Number of Microbes Introduced into the Antiseptic Solutions make an Appreciable Difference to the "Lethal Concentration" of the Antiseptic?

Browning and his co-workers in their experiments on flavine added 0·1 c.c. of a 1 in 20,000 dilution of a peptone water culture of the organism to 1 c.c. of the antiseptic solution. A loopful of such a dilution of the culture "yielded 20 or more colonies." We see, then, that in all cases they gave the antiseptic only a very few microbes to kill. I made some experiments with a view to ascertaining what difference was made to the apparent lethal concentration of an antiseptic by the addition of varying numbers of microbes.

Experiment 6.—Progressive dilutions of carbolic acid, crystal-violet, and flavine were made in broth, and to 0·5 c.c. of each of these dilutions was added 0·5 c.c. of a staphylococcus emulsion in broth. A control tube was put up in which the antiseptic was replaced by broth, and 10 c.mm. of this control tube yielded 32 colonies when plated on agar. Thus the staphylococcal emulsion used in this case was probably somewhat weaker than that used by Browning. Another set of tubes were put up identical with the last, except that the staphylococcal emulsion used was 5,000,000 times as strong. The tubes were incubated at 37° C. At intervals 10 c.mm. samples were taken out and transferred to broth tubes. The results are shown in Table III.:—

TABLE III.—*Effect of Variation of the Strength of the Bacterial Emulsion on the "Lethal Concentration" of an Antiseptic (in Broth).*

Carbolic Acid.						Crystal Violet.						Flavine.					
Concentration of antiseptic.	Strong emul. of staph.*			Weak emul. of staph.			Concentration of antiseptic.	Strong emul. of staph.			Weak emul. of staph.			Concentration of antiseptic.	Strong emul. of staph.			Weak emul. of staph.		
	Time of action of antiseptic (in hours).							Time of action of antiseptic (in hours).							Time of action of antiseptic (in hours).					
	2	5	23	2	5	23		2	5	23	2	5	23		2	5	23	2	5	23
1 in—							1 in—							1 in—						
100	+	O	O	O	O	O	10,000	+	+	O	O	O	O	1,000	+	+	O	O	O	O
200	+	+	+	+	O	O	20,000	+	+	+	O	O	O	2,000	+	+	O	O	O	O
400	+	+	+	+	+	+	40,000	+	+	+	+	+	O	4,000	+	+	O	O	O	O
800	+	+	+	+	+	+	80,000	+	+	+	+	+	O	8,000	+	+	+	O	O	O
							160,000	+	+	+	+	+	O	16,000	+	+	+	+	+	O
							320,000	+	+	+	+	+	O	32,000	+	+	+	+	+	O
							640,000	+	+	+	+	+	O	64,000	+	+	+	+	+	O
							1,280,000	+	+	+	+	+	+	128,000	+	+	+	+	+	O
							2,560,000	+	+	+	+	+	+	256,000	+	+	+	+	+	O

* Staph. = Staphylococci; emul. = emulsion.
+ = Growth on subculture. O = Complete sterilisation.

Experiment 7.—Two series of experiments were made, the only difference being that in the one case the staphylococcal emulsion was 100,000 times stronger than in the other. Progressive dilutions of flavine were made in serum, and one volume of each of these dilutions was thoroughly mixed with an equal volume of staphylococcus emulsion in serum, incubated in capillary tubes at 37° C. for 24 hours, after which the contents were blown out into broth tubes. The results were as follows.

Staphylococcus emulsion.	Strength in which flavine acted on the bacteria.						
	1/20000	1/40000	1/80000	1/120000	1/240000	1/480000	Control
Strong ...	Growth	Growth	Growth	Growth	Growth	Growth	Growth
Weak ...	0	0	0	0	Growth	Growth	Growth

These two experiments show clearly that the number of microbes on which an antiseptic has to act either in broth or serum plays an important part in the determination of the lethal concentration of an antiseptic. We see also from Experiment 6 that in respect of changes in the number of microbes flavine is much more sensitive than is carbolic acid. It follows from this that, as the antiseptic has to act in wounds both heavily and lightly infected, this factor must be taken into account in any comparison of antiseptics.

What is the Concentration of Flavine which will Inhibit the Growth of Microbes in Serum?

Experiment 8.—Progressive dilutions of flavine were made in serum. To one volume of each of these dilutions was added one volume of serum which had been implanted with the microbe used in the test.

As some microbes grow badly in serum and do not macroscopically show evidence of growth, I added to the serum in some cases 1 20th of its volume of trypsin (which was just in excess of the quantity necessary for the neutralisation of the antitryptic power of the serum) and sometimes 1/50th of its volume of 50 per cent. glucose solution. Trypsin made the serum a good cultivation medium, and the glucose was acted on by the microbes with the production of acid in the case of cocci and acid and gas in the case of *B. coli* and *B. proteus*.

These experiments were conducted in miniature test-tubes, and after the mixtures had been made in the tubes melted vaseline was poured on the surface of the cultivation fluid to make a layer about 1 cm. deep.

TABLE IV.—*Inhibitory Action of Flavine on the Growth of Microbes in Serum.*

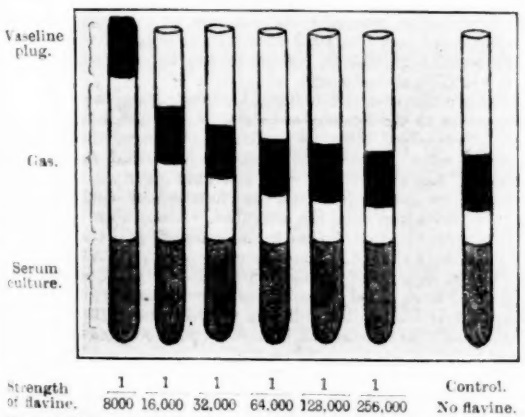
No.	Organism.	Medium	Time of action of antiseptic.	Lowest concentration of flavine in which no growth occurred.	Greatest concentration of flavine which showed growth.
1	Staphylococcus.	Serum + Trypsin + Glucose.	3 days	1 80,000	1 160,000
2	,,	,, ,, ,,	7 ,,	1 16,000	1 32,000
3	*B. coli.*	,, ,, ,,	18 hrs	—	1 1000
4	*B. proteus.*	,, ,, ,,	36 ,,	1 1000	1 2000
5	,,	Serum + glucose	7 days	1 4000	1 8000
6	*B. coli.*	,, ,,	7 ,,	1 2000	1 4000

This vaseline protected the fluid from outside contamination, and at the same time it was forced up the tube by any gas that was formed in the cultivation fluid it served as an easy method of measuring the amount of gas and giving some index of the amount of growth.

In these experiments the number of microbes implanted was not estimated, but in all cases it was considerable (usually a loopful of bacteria from an agar culture was emulsified in about 3 c.c. of serum).

The results are set forth in Table IV.

FIG. 2.



Growth of *B. proteus* in serum + flavine, showing the great increase of growth (as evidenced by increased gas-production) in the stronger dilutions of flavine. (⅔ actual size.)

Experiment 4 of Table IV. requires special mention. At the end of 36 hours the tubes containing the three strongest concentrations of flavine—namely, 1 in 1000, 2000, and 4000—were opened and examined. Pure growths of *B. proteus* were obtained from all of them. The remaining tubes were left standing on the bench, and after one month it was noticed that they showed a gradual increase in the amount of growth as evidenced by the gas formation, from the control tube, in which there was no flavine, to the tube containing the greatest concentration of flavine (1 in 8000). The diagram (Fig. 2), drawn to scale, represents the height of the gas column in the various tubes.

The increase in the gas formation in the stronger flavine concentrations indicates that in some way flavine had favoured the growth of the microbes, and the regularity of the increase further proves that it is not accidental but is actually due to the flavine, as the contents of the tubes are identical except as regards this substance. Experiment 5 of Table IV. confirmed this result.

Antiseptic Value of Flavine in Serum.

It has been shown in Table IV. when dealing with the inhibitory action of flavine on the growth of microbes in serum that staphylococci can grow in 1 in 32,000 flavine, *B. coli* in 1 in 1000, and *B. proteus* in 1 in 2000. Experiment 7 also shows that sterilisation of a strong staphylococcus emulsion is not effected by a 1 in 20,000 dilution of flavine, although when using a weak emulsion 1 in 160,000 is sufficient to kill all the microbes. (This last figure is practically the same as the figure given by Browning as the lethal concentration of flavine in serum on staphylococci.) In another experiment in which I used a large number of staphylococci I found that growth resulted after a 24-hour exposure to a 1 in 2000 dilution of flavine in serum. Usually, however, when a fairly strong staphylococcal emulsion is used complete sterilisation is effected in 24 hours by a 1 in 4000 to a 1 in 16,000 dilution.

Flavine 1 in 8000 in serum sterilised a *B. coli* emulsion containing 1500 million living organisms per c.c., while 1 in 64,000 sterilised an emulsion of 4000 *B. coli* per c.c.

Antiseptic Value in a Non-serous Medium.

Table III. gives details of the antiseptic value of flavine in nutrient broth, from which it appears that in 23 hours a 1 in 8000 dilution failed to sterilise a strong emulsion of staphylococcus, while a 1 in 256,000 was capable of sterilising a very weak emulsion.

It was found that when flavine was added to a 48-hour-old broth culture of staphylococcus in sufficient quantity to make a 1 in 1000 solution it was unable to kill all the cocci in 24 hours at 37° C. Carbolic acid 1 in 100 rendered a similar culture sterile in less than six hours.

Antiseptic Power of Flavine in Blood in Vitro.

Experiment 9.—Progressive dilutions of a 1 per cent. flavine solution were made in defibrinated human blood and one volume of each of these was mixed with one volume of the same blood containing staphylococci. Two sets of experiments were made, the only difference being that the staphylococcal emulsion was 100,000 times as strong in the one as in the other. The mixtures were incubated at 37° C. for 24 hours and then planted into broth. The results were as follows:—

Staphylococcus emulsion.	Concentration of flavine.					—
	1/2000	1/4000	1/8000	1/16000	1/32000	Control.
Strong	0	Growth	Growth	Growth	Growth	Growth
Weak	0	0	0	,,	,,	,,

This experiment shows that the antiseptic action of flavine is much weaker in blood than it is in serum.

Action of Flavine on Pus.

When strong solutions of flavine are mixed with equal parts of pus they cause a very marked agglutination of the pus cells, and after incubation it can be seen that the pus in such a mixture has become mucoid in consistency. This mucoid alteration of the pus, which is probably due to the destructive nature of flavine on the cells, is noticeable up to a 1 in 6000 dilution. In wounds treated with flavine this mucoid appearance of the pus is sometimes manifest, and it may be that this will interfere with the distribution of the antiseptic. As in wounds, however, there appear to be so many factors which interfere with the action of flavine that it is unnecessary to lay much stress on this.

Antiseptic action in pus.—In these experiments flavine in saline solution was thoroughly mixed with pus from wounds either in equal parts or in the proportion of 1 part of flavine to 9 parts of pus. The specimens of pus were obtained from wounds in different stages of healing, and they differed materially in the nature and the number of microbes contained in them. No account was taken of the spore-bearing anaerobes, as we were dealing here only with the action of

flavine on the vegetative forms of bacteria. In all cases the antiseptic was allowed to act on the pus for 24 hours at 37° C., after which a sample of the mixture was planted on agar or into broth. Seven specimens of pus were subjected to the action of flavine in a concentration of 1 in 1000 and in only one of these was sterilisation effected. In the other six specimens the resultant cultures did not differ as regards the variety of microbes from the control cultures. Staphylococci, Streptococci, coliform bacilli, *B. pyocyaneus* and *B. proteus* all survived the action of flavine. We see, then, that flavine is a relatively weak antiseptic in pus, and that in only one case was a concentration of 1 in 500 (twice the strength recommended for use in wounds) capable of sterilising an equal volume of pus.

It is obvious that there is something in pus which prevents the action of flavine on the microbes. The concentration required to kill microbes in pus is far greater than that required in serum, although the liquor puris is of a serous nature. The simplest explanation of this is that the pus cells have a greater attraction for flavine than have the microbes. In this connexion some experiments were made on the "quenching" power of pus on flavine.

Experiment 10.—Equal quantities of flavine (1 in 500) and pus were mixed and immediately centrifuged. The antiseptic power of the supernatant fluid was then tested on staphylococcus emulsified in serum and compared with the lethal power of fresh dilutions in serum of flavine (from a 1 in 1000 solution in normal saline) on the same emulsion of staphylococci. The "quenched" flavine undiluted was just capable of sterilising this serum in 24 hours, but a twofold dilution was insufficient, whereas with fresh flavine complete sterilisation was effected by a 1 in 8000 dilution.

We see then that by contact with an equal volume of pus a 1 in 500 dilution of flavine loses 7/8ths of its antiseptic power almost immediately.

Experiment 11.—Flavine dilutions 1 in 100, 200, 400, and 800 were mixed with equal volumes of pus and centrifuged immediately. The intensity of the colour in the supernatant fluids were tested by putting equal sized drops of these on a white filter paper and matching these with a series of similar drops of progressive dilutions of fresh flavine. By this method it was found that the two strongest flavine dilutions exhausted with pus had lost half, the 1 in 400 dilution had lost 2/3rds, and the 1 in 800 had lost about 5/6ths of the colour intensity.

These two experiments show clearly that flavine by intimate contact with pus loses a large part of its power practically immediately.

The results of the absorption of flavine by pus cells naturally leads to the question of the affinity of other cells of the animal body for this substance, and the following experiments were designed to give some indication of what happens when flavine is injected into the body.

Browning and his co-workers state that flavine (1 in 1000) can be administered intravenously without toxic effect, and because of this non-toxic action flavine has been used intravenously as a therapeutic measure in conditions like streptococcal septicæmia in the hope that the dye will have a directly lethal effect on the cocci in the blood.

Experiment 12.—A rabbit, weighing 3 lb., was injected intravenously with 10 c.c. of flavine (1 in 1000). Blood was taken before, immediately after, and again 15 minutes after the injection. The sera which separated from these blood specimens did not show the slightest trace of the canary-yellow colour of flavine or any fluorescence, and none of them had the slightest bactericidal effect on staphylococcus or inhibitory power on the growth of this organism. The urine, which was bright yellow, had no bactericidal power on staphylococcus.

We see therefore that flavine is immediately removed from the blood, which does not acquire any bactericidal action, and that therefore there is no justification for the therapeutic use of flavine intravenously as an antiseptic.

Browning and his co-workers have recommended the injection of flavine into the tissues as a means of preventing the spread of infection. As it is impossible to recover the flavine injected this way, I tried to get some idea of the fate of this substance when injected into closed spaces by introducing it into the pleural and peritoneal cavities of animals.

Experiment 13.—Two c.c. of flavine (1 in 100) were injected intraperitoneally into a three quarters grown rat. Two hours afterwards the rat was killed, and it was found that all the tissues of the body with the exception of the brain were coloured bright yellow. Serum from the heart blood showed not a trace of the yellow colour of flavine. The urine was bright yellow. The peritoneal fluid, urine, and blood were found to be without antiseptic power on staphylococcus.

Experiment 14.—Two c.c. of flavine (1 in 100) were injected into the pleural sac of a full-grown rat. Death resulted within two hours. All the tissues were bright yellow except the brain. The blood serum was distinctly yellow. The pleural fluid and the blood serum failed to kill in 24 hours a few staphylococci.

It follows from these experiments that when flavine 1 per cent. is introduced into a closed cavity in the animal body it loses its antiseptic power within two hours. Much more rapidly, then, will the (1 in 1000) solution recommended for use lose its potency.

It might be argued that when flavine is introduced into the body it is immediately taken up by the muscles, connective tissues, &c., and that these are the tissues in which flavine would be useful in combating a severe local infection. On theoretical grounds it is unlikely that when these tissues have such an affinity for the dye they will give it up to bacteria, but I tested this in the following experiment.

Experiment 15.—22 c.c. flavine (1 in 1000) were injected intravenously into a small rabbit. Death resulted immediately. Within half a minute blood was drawn from the heart and serum from this was distinctly yellow. Five minutes later another sample of blood was taken from the subclavian artery and showed no trace of yellow colour, thus proving that all the dye injected had been taken up by the tissues. All the organs and muscles were a bright yellow colour. A leg was amputated and into one of the muscles a small quantity of a broth culture of *B. perfringens* was implanted. In four hours at 37° C. there was obvious growth of the organism with gas formation. Portions of all the organs were planted with small amounts of *B. perfringens* and growth resulted in every case.

This experiment shows that flavine introduced intravenously, even in a dose far greater than would be given to man, is incapable of conferring on the tissues any inhibitory power against the growth of a microbe such as *B. perfringens*.

The great affinity which muscle tissue exerts towards flavine can be shown also by grinding up 1 gm. of muscle with 1 c.c. of flavine 1 in 1000 and testing the colour intensity of the resulting free fluid. This colour will be found to be reduced to about one-eighth of its original strength.

The Action of Flavine in Wounds.

Browning has scouted the suggestion that the potency of an antiseptic in pus gives much indication as to the value of such an antiseptic in a wound.[4] Of course, in dressing a wound all the pus in the cavity should be washed away before a fresh dressing is applied, but the exudation from the walls of the wound will consist of a serous fluid with a larger or smaller number of cells and a variable number of microbes, some inside the cells and some free. This fluid, then, is not far removed from pus, and it is in this fluid that the antiseptic applied is first going to act. Also the antiseptic and the fluid are not going to be intimately mixed as in test-tube experiments, but the antiseptic has to penetrate into the fluid by diffusion. Thus the test tube experiment appears to be the less severe test for the antiseptic.

The action in this purulent exudate is only going to throw light on what is happening in the cavity of the wound, and any antiseptic, before it can begin to approach the ideal, must act beyond the cavity in the infected walls of the wound. Here it would have to act in a tissue composed largely of cellular elements and bathed in a serous fluid. No claims were made as to the penetrative powers of flavine, but in the light of the experiments quoted above, which show that the muscular tissues and the leucocytes have a very great power of reducing the potency of flavine, it is hardly conceivable that any penetrative power can exist. Any antiseptic action of flavine, therefore, would be confined to the cavity of a wound, and, as it must act in the cavity in a fluid akin to pus, we have seen from the above experiments on its antiseptic action in pus that its potency when applied as is recommended in a 1 in 1000 dilution can only be very weak, much weaker, indeed, in regard to the concentration used than would be carbolic acid.

We have also seen that flavine, although it appears to have little action on the leucocytes in a few minutes, has a most destructive effect when its action is prolonged over some hours, an effect greatly in excess of its lethal action on bacteria. Let us consider what this may mean in a wound cavity. The leucocytes when they first appear would not be hindered from ingesting the microbes. Soon, however, they would themselves fall victims to the toxic effect of the flavine, and it is likely that this would occur before they had time to destroy the microbes ingested. The flavine itself would be unlikely to have killed the microbes before they were ingested, as its lethal effect on bacteria is a very slow one. It has been shown that the ingestion of microbes by leucocytes serves as a protection of such microbes against antiseptic solutions. Thus the slow toxic action of the flavine on the leucocytes, instead of being a virtue, may actually allow the bacteria to be protected against any antiseptic powers which flavine may possess.

"Therapeutic Coefficient."

Lastly, we might shortly consider the value of the so-called "therapeutic coefficient" as an index of the value of an antiseptic. This has been defined by Browning and his

[4] Browning: Brit. Med. Jour., Feb. 3rd, 1917.

co-workers as the concentration which reduces phagocytosis 50 per cent. divided by the concentration just sufficient to kill bacteria in serum. A consideration of the text of their article, however, shows that it really amounts to a comparison of the toxicity to leucocytes with the toxicity to bacteria (acting in serum). The experiments which I have detailed above show clearly that in regard to flavine this coefficient, as arrived at by the authors of the expression, gives information so misleading that as a practical test it is quite valueless. In calculating the toxic power of substances towards leucocytes they apparently paid no attention to the time factor, but in all cases used 20 minutes only as the time during which the action on leucocytes was observed. It would seem obvious that just as antiseptics act quickly or slowly on bacteria, so they will act quickly or slowly on leucocytes. Thus in the 20 minutes allowed only the antiseptics which acted rapidly on the leucocytes (and probably also on the bacteria) showed anything like their true effect. If we take flavine as an instance of how neglect of the time factor permitted quite wrong conclusions to be drawn, we see that the numerator of the "coefficient" in 20 minutes is 1 in 500, whereas it is over 1 in 2,000,000 if 24 hours is the time allowed. Thus by a small alteration in the experimental method we get an alteration of the coefficient by at least 4000 times to the detriment of flavine.

Again, the "lethal concentration" on bacteria in serum is a very variable quantity, and it has been shown above that by altering the strength of the bacterial emulsion the lethal concentration to staphylococcus can be varied from 1 in 2000 to 1 in 160,000, or a variation of 80 times.

We see, therefore, that in respect of flavine the numerator of the "therapeutic coefficient" is subject to a variation of at least 4000 times and the denominator to a variation of 80 times. This is quite sufficient to show that the coefficient is worthless as a standard of antiseptic value. Browning and his co-workers in their calculations of the "therapeutic coefficient" of different antiseptics happened to choose all the conditions which favoured flavine—namely, a long period of action on the microbes, a serous medium in which to test the bactericidal action, a few microbes to kill, and a short period of action on the leucocytes. Thus they obtained a coefficient for flavine 800 times better than that given by carbolic acid. If, however, they had used many microbes and had allowed the antiseptics to act on the microbes and leucocytes alike for 24 hours they would have found that carbolic acid gives a coefficient at least ten times better than flavine where serum is the medium employed, or 250 times better if the lethal concentration were estimated in pus.

The experiments detailed in this paper show that the theoretical basis for the use of flavine is thoroughly unsound, and that there seems nothing to specially recommend this substance as an antiseptic for use in septic wounds.

Summary.

1. Flavine strongly agglutinates human red corpuscles up to a dilution of 1 in 3200.
2. Flavine has a strong anticoagulant effect on human blood.
3. Flavine in a concentration of 1 in 2000 completely inhibits leucocytic emigration.
4. Flavine has a very destructive action on leucocytes, and if the action on leucocytes and bacteria be each tested for 24 hours its leucocidal action is far in excess of its bactericidal action.
5. The number of microbes on which an antiseptic has to act has a very marked effect on the "lethal concentration" of the antiseptic.
6. This alteration of the "lethal concentration" with the number of microbes varies in degree with different antiseptics, and appears to be especially marked in the case of certain aniline dyes. This factor must in all cases be taken into account in any comparison of antiseptic values.
7. When many microbes are used it requires a much greater concentration of flavine to effect sterilisation than that given as the "lethal concentration" by Browning and his co-workers.
8. In serum under certain conditions staphylococci will grow in 1 in 32,000 flavine, *B. coli* in 1 in 1000, and *B. proteus* in 1 in 2000.
9. Flavine 1 in 8000 appears to aid the growth of *B. proteus*.
10. Flavine 1 in 500 is usually unable to sterilise in 24 hours an equal volume of pus from a wound.
11. Flavine injected intravenously in large doses immediately disappears from the blood, which acquires no bactericidal power, and is taken up by the tissues, which become yellow but acquire no inhibitory power on the growth of bacteria.
12. Flavine 1 in 100 injected into the pleural or peritoneal cavities loses its antiseptic power within two hours.
13. Flavine is rapidly absorbed by pus or muscle tissue.
14. The so-called "therapeutic coefficient" of flavine can be changed with slight variations of the experimental method by at least 300,000 times.
15. If the antiseptic is allowed to act on staphylococci and leucocytes alike for 24 hours and the ratio is taken of its toxicity to both of these, carbolic acid has a coefficient 10 times better than flavine when the antiseptic acts on the microbes in serum and 250 times better when the bactericidal action is estimated in pus.

NERVOUS UNREST IN THE INFANT AS A CAUSE OF THE FAILURE OF BREAST-NURSING.

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IN THE LANCET of Sept. 27th, 1913, I published a paper upon the causes of the failure of women to nurse their infants at the breast. I then urged that in the first establishment of the milk-flow the part played by the mother was essentially a passive one, and that her contribution towards a successful result was limited to providing a nipple sufficiently large for the child to grasp firmly. If the nipple was well developed the causes of failure were commonly to be found not in the mother but in the child. I maintained that we had to distinguish between circumstances which prevented or delayed or interfered with the establishment of milk during the early weeks of lactation and circumstances which shortened the period of efficient lactation in the later months, and that the former—save in the all-important question of the nipple—were concerned chiefly with defects in the child, while the latter were commonly dependent upon the condition of the mother.

Among the causes which interfere with the suction of the infant, and so with the proper establishment of the milk-supply, I enumerated the following: (*a*) Dyspnœa from nasal catarrh, adenoid vegetation, the snuffles of congenital syphilis, bronchitis, or congenital heart disease. (*b*) Infective or toxæmic states of all sorts, with or without pyrexia. (*c*) Conditions such as cleft palate, facial paralysis, Bednar's aphthæ, or stomatitis which interfered mechanically with suction. (*d*) Prematurity and congenital debility. Further, I referred to the adverse influence of mixed feeding instituted soon after birth in the hope of preventing the supposed ill-effects of the period of physiological inanition which precedes the "coming-in" of the milk, and I laid stress upon the danger of chilling the infant, a disaster which is apt to occur in weakly babies unless carefully graduated artificial heating takes the place of the warmth of the mother's body.

The dyspnœic child lets go the nipple from exhaustion and because he cannot breathe and suck at the same time. The premature child and the child deprived of sufficient heat are sometimes too somnolent to sustain a sufficient effort. The infected child may have no appetite or desire for food. The child who has sucked once or twice from an easily running bottle may obstinately refuse the exertion of pulling at a still empty breast. The child with a cleft palate or facial paralysis cannot maintain the necessary vacuum.

Nervous Unrest in the Infant.

I wish now to call attention to another defect in the child which, in my experience, is not uncommonly a cause of failure to nurse successfully—the inhibition of the sucking reflex by the infant's nervous unrest and excessive emotional display. In the young infant the act of suction is not voluntary but reflex. It proceeds perfectly, as has often been observed, in an acephalic monster which is provided only with medullary

centres. This reflex act of sucking is produced by stimulation of the lips and tongue. A finger placed upon the dorsum of the tongue in a certain position will instantly provoke a powerful movement of suction. The reflex fails to appear if the child is too somnolent and inert. It will also fail to appear if inhibited by extreme emotional excitement. In some infants, generally of pronounced neurotic inheritance, the sudden change of environment which accompanies birth is capable of arousing a veritable nerve storm. New sensations of pressure and of heat and cold which stream into their consciousness produce a paroxysm of unrest. The infant starts convulsively at the gentlest touch, at a bright light, or a loud sound. Sleep is resolutely refused, and wild, hysterical crying may last for hours at a time. All this unrest increases the need for food, and, until effective suction has drawn the milk into the breast, no food is forthcoming. The normal child spends almost all the first 24 hours in deep sleep, until he is roused by the oncoming sensations of hunger. The baby whose nerves are on edge and who shows it by incessant, angry crying and restless movement, is likely to suffer much earlier as well as much more severely from the sensation of hunger. If when put to the breast he sucks strongly, then the vigour of his suction soon produces its own reward in the early appearance of the milk, and all is well. Unfortunately this is not the usual result of this excessive emotional display. Too often the nervous unrest inhibits the sucking reflex. Crying, spluttering, and gulping, the child mouths and bites at the nipple without fastening on, or, throwing back his head, continues to squirm and struggle without taking any notice of the proffered breast. Hunger adds to the unrest, and unrest to the hunger, until everyone is tired out, the attempt at nursing is abandoned, and artificial feeding is begun. With the bottle the difficulty does not persist in the same degree, partly because its flow is so readily produced by a minimum of suction, still more because, while it is almost impossible to follow with the mother's nipple the restless movements of the wriggling little face and mouth, it is easy enough to keep the teat of the bottle in position.

The constant crying has a further disadvantage in the ill effect it has on the mother. After the distress and pains of labour many women are in no condition to bear any further nervous strain. The pitiful crying and the repeated unsuccessful attempts are both exhausting to her and depressing. Unless we can intervene with successful treatment we cannot expect the mother to wait patiently and hopefully in the assurance that in the end all will come right. Fortunately, it is a condition which is comparatively amenable to treatment.

General Treatment.

A great deal can be done by simple measures, by insisting upon a half-darkened room, a warm, soft bed, and absolute quiet. The infant should be handled as little as possible, and when lifted the movement should be steady and gentle. Dandling the baby in arms, patting him on the back, expostulating with him, and talking to him generally only make matters worse. If by measures such as these a few days' sound sleep can be secured our difficulties are at an end. It is a proper practice to put babies to the breast at regular intervals. Ordinary babies of sound nervous organisation soon learn to adjust their appetites to routine, and crying and restlessness begin only when the meal is due and are not excessive. With the neurotic infant we shall wreck all by a too strict adherence to a rigid scheme and time-table. With such a child, after a passionate fit of crying lasting a quarter of an hour or more nursing may be most unsatisfactory. Either the crying continues and the child takes no notice of the breast, or after drinking rapidly, with much gulping and spluttering, he suffers immediately torments of indigestion, with renewed crying and restlessness. Digestion is inhibited by excessive emotional display in infants as in adults. With such children our only chance of success is to be active in seizing every reasonable opportunity that presents itself, having regard to rational time limits, to get the child to the breast while he is still asleep. If very gently the slumbering child can be brought to the breast before he wakes with that convulsive start which is immediately followed by a storm of crying, if while he still lies between sleeping and waking the nipple can be gently inserted into his mouth, the sucking reflex comes to its own again, and not only is the breast drained steadily and well, but the subsequent process of digestion is much more likely to be undisturbed. The ordinary conditions of nursing routine, in a sense, must be reversed. Till the nervous system becomes quieter we must feed the baby not when he wakes but when he sleeps.

Medicinal Treatment.

If opportunities for feeding the child are not sufficient—that is to say, if it is impossible, with all care to avoid stimulation, to find sufficient occasions when with the child asleep a meal is even approximately due—then it is not a difficult matter to increase their number. For this purpose chloral hydrate is peculiarly suitable. I have found that its effect in quieting the child and producing sufficient somnolence to allow the sucking reflex full play is much more marked, more certain, and more immediate than that of potassium bromide. It should be given 20 minutes before the intended meal-time. One grain is usually enough for a very young baby, dissolved in a teaspoonful of water with a little syrup of orange. I have sometimes had to adopt this manœuvre before each of five or six meals in the day, but, as a rule, three grains in the 24 hours will be sufficient, because other opportunities of feeding the child after sound sleep and, if possible, without rousing him, will present themselves. In cases in which the diagnosis of the cause of the unrest and of the secondary dyspepsia is well established the most satisfactory results may follow this treatment. It is at least possible in a given case to put the matter to the test and to be guided by the result. I have very often demonstrated in the out-patient department how the restless, crying baby will utterly refuse to suck, and yet, after receiving a single grain of chloral and being put to rest quietly for 20 minutes, will draw the breast with regular, deep, and uninterrupted suction.

The nervous dyspepsia of infants is controlled in the same way more efficiently by chloral than by any other drug. The children often have a distinct neurotic inheritance. They are thin and meagre, but, in contrast to what is usually found in primary dyspepsia, their muscular tone is often excessive. The limbs are a little rigid, and the abdomen is often retracted rather than distended, with the outline of the recti muscles unduly apparent. Their movements are very strong and powerful. They wriggle all the time and the mother usually complains that they "almost jump out of her arms." They cry almost incessantly. If fed after crying digestion appears to be a most painful process. Regurgitation of food, sometimes explosively, is common. Without actual diarrhœa—that is, without change in the character of the stools—the bowels are often open eight or ten times in the day. Instead of two or three large motions there are often very many small evacuations passed with much wriggling and grunting. The taking of food is almost always followed by the passage of a stool and the "changing" and cleaning necessary rouse the child to crying and upset the sleep that should accompany digestion. Treatment of this form of dyspepsia by ordinary measures is not successful. The usual routine limitation of the food is actually harmful, for the child stands hunger very badly and the nervous unrest is directly increased. As a rule, the symptoms yield to suitable doses of chloral and bromide. With sound, deep sleep the digestive processes are no longer inhibited by mental irritation and the needs for food fall to a much lower level because the muscular work is promptly diminished.

I am loth to suggest further drug-taking for babies—they suffer now, I think, from excessive prescribing—but I believe that the judicious use of small doses of chloral in this way will be found to be effective in preserving the breast-milk for a considerable number of nervous babies of nervous mothers, and in combating the gastric and intestinal hyperæsthesia which seem to be dependent upon excessive emotional display on the part of the child. The diagnosis of the condition and its differentiation from primary dyspepsia, or from dyspepsia due to infection, with secondary nervous unrest, is not always easy. But to determine the cause of the failure of nursing in the first few weeks of life is often enough difficult. The pity is that it is sometimes not even attempted.

A SOMERSET CENTENARIAN.—Mr. F. W. Stubbins, of Worle, celebrated the 102nd anniversary of his birthday on July 18th.

SOME PRINCIPLES OF PLASTIC SURGERY:

INCISIONS, CONTOUR, AND THE SUTURE.

BY J. L. AYMARD, M.R.C.S., L.R.C.P. LOND.,
TEMPORARY CAPTAIN, R.A.M.C., QUEEN'S HOSPITAL, FROGNAL, SIDCUP, KENT.

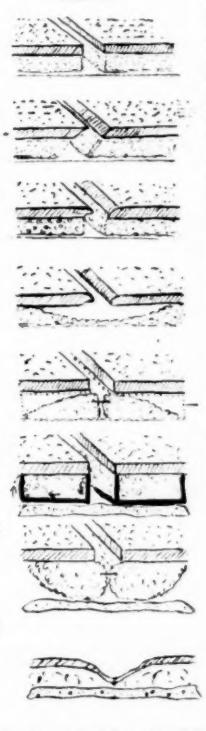
THE prime factors of artistic work in the department of plastic surgery are the restoration of contour and the correct method of suturing. The disappointing appearance of much careful plastic work is vaguely recognised by the untrained observer who has any artistic perception; the trained artist sees at once that the essential thing which is so frequently absent from work which is otherwise admirable is the right degree of fullness which would have restored a flat surface to its normal contour.

The three important factors, which I propose to deal with here, necessary to bring about a contour as nearly normal as possible are: first, the correct method of incising the skin; secondly, the manipulation of the deeper structures; and, thirdly, the best method of bringing about satisfactory union. The other equally important factors, such as freedom from sepsis, condition of patient, &c., are already well known.

The Skin Incision.

In dealing with the question of skin incision we are, as far as I know, limited to two methods: the one in which the skin is divided at right angles to the surface and the other upon the slant. The latter method was fully described in THE LANCET some 11 years ago[1] and demonstrated by me in Sir Arbuthnot Lane's clinic at Guy's Hospital. Two years later it was discovered by the Germans and later by the Americans, in each case without acknowledgment. Having practised this incision continuously since this period, I may be permitted to draw attention to its value again, especially since it is now so frequently used in plastic surgery in this country to-day.

FIG. 1.



A, Ordinary incision at right angles to surface of skin.
B, Author's incision upon the slant.
C, Appearance assumed immediately after incision.
D, To demonstrate undercutting of skin.
E, Ordinary fat flap.
F, Author's deep-tissue flap incision for.
G, Author's deep-tissue flap rolled in position.
H, Deep scar with loss of tissue.

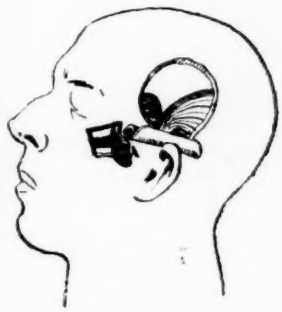
A, Fig. 1, is intended to represent the usual incision at right angles to the surface; B, that in which the skin is incised upon the slant. At the moment of incision the actual appearance is doubtless as represented, but almost immediately the condition of C is produced. The upper flap assumes a curved form and the under one a convex. The actual edge of the skin of the upper flap presents an appearance (not illustrated) resembling the cutting edge of a saw and not unlike a fringe. This condition is due to the fact that the skin is not flat, but, on the contrary, a series of ridges and holes. This ragged edge must often have been observed by surgeons when commencing the incision for a Thiersch graft. The surgical importance of the contracted rolled-in edge of the upper flap is that it is liable to be cut off if the knife is introduced twice instead of making one clean incision. My slanting incision is very suitable for incisions in the neighbourhood of the cheek, the mouth, the chin, and the forehead, but around the eye and in the neck, where the skin is loose and mobile, the right-angle one is the more suitable.

[1] Invisible Surgery, by J. L. Aymard, THE LANCET, May 12th, 1906.

Method of Dealing with the Deeper Structures.

Having dealt with the skin incisions, we have next to consider how the deeper tissues must be dealt with in order to fill up the gap produced by the excision of a depressed scar as illustrated at H, Fig. 1. Leaving out the question of free grafts and the introduction of foreign bodies, we have only the fat and neighbouring tissues to make use of. Provided the depression is only slight, simple undercutting, as represented at D, may suffice. A common method, however, is to undercut the skin and divide it from the fat, as represented by the dotted line in E, rolling it together as shown, but the method I much prefer and now almost always employ is shown in F. The thick black lines represent the undercutting straight down to the bone, and in the direction of the arrow marks up to the skin; the block is thus dependent upon the skin flap for its blood-supply. These blocks of tissue can then be easily rolled inward, as G, and secured with catgut, thus filling up the gap and restoring the contour.

FIG. 2.



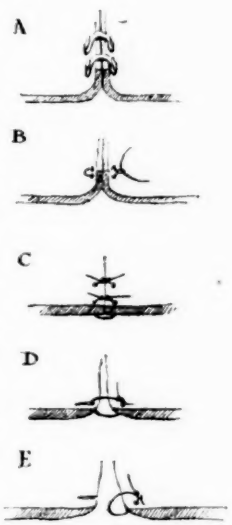
Major H. D. Gillies's temporal muscle flap.

An ingenious method of deep-tissue adjustment is that devised by my colleague, Major H. D. Gillies, to fill up depressions caused by loss of malar bones. The diagram, Fig. 2, shows how he partially separates, and turns down under a bridge of skin, a portion of the temporal muscle. I have seen some excellent results due to the employment of this method.

Method of Suturing.

The next question is how to adjust the skin. Until fairly recently I have endeavoured to bring the edges of my incision into perfect apposition with the hope that they would so remain, but, in a large plastic operation, with the knowledge that I should have to recognise that the result was ordinarily successful if as many as two-thirds of my sutures held in position, taking into consideration all the troubles so frequently attending such an extensive operation, I am now satisfied to sacrifice any immediate cosmetic appearance in the theatre for what I know to be the better method of attaining an ultimately good result. I have long suspected that the appearance of a wound two days after operation was deceptive—that is to say, that whilst the interrupted suture still held, the cuticle only was in contact, and that a condition resulting in D, Fig. 3, was, in fact, in existence, to be followed by E, or in the long run the alternative of an otherwise unaccountably wide scar.

FIG. 3.



A, Michel's clip as ordinarily used.
B, Mattress suture now extensively used by author.
C, Interrupted suture.
D, Appearance of skin edge with slight tension.
E, Complete break-down, appearance of.

Every general surgeon must have been struck by the small linear scar invariably produced by the use of the Michel clip, A, Fig. 3, which is clearly due to the apposition of a substantial surface of the two edges which subsequently stretch into approximately the normal position. Whether the skin be cut upon the slant or at right angles I now almost entirely employ the mattress suture (B, Fig. 3), which gives the same result as the Michel clip. The clip is not suitable for the face, because it occupies too much space and is difficult and painful to remove in this region. The mattress horsehair suture, on the contrary, cuts quickly through the

cuticle, but holds the deeper tissues until union is secured, despite moderate tension and even suppuration, should it occur. This, however, is not meant to imply that I neglect in the least the additional safeguard of that most valuable adjunct in plastic surgery—the relaxation suture, whether in the form of the corrugated vulcanite disc with silkworm gut or my wire and clip method.

A METHOD OF APPLYING ANTISEPTICS TO THE DEEPER PARTS OF WOUNDS.

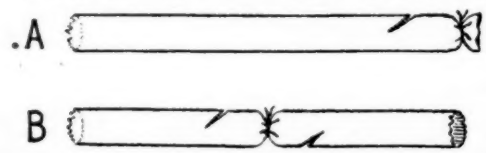
BY THOMAS H. KELLOCK, M.C. CAMB., F.R.C.S. ENG.,
CAPTAIN, R.A.M.C. (T.)

THE multitude of septic wounds at the present time, which occupy the attention of so many medical men, has very naturally given rise to the use of a variety of antiseptics and many methods of application. To judge of the efficiency of the former due attention should be paid to the latter, and it is obviously unfair to judge of the value of an antiseptic when it is only applied to the part of a wound that is visible. In every wound of any magnitude there must be recesses and deep parts into which, however well such a wound may be drained, the antiseptic applied in this way never reaches and where organisms may collect and multiply unmolested.

The Carrel method of irrigating wounds has done a good deal to improve their treatment and has drawn attention to the advantage of applying antiseptics to the deeper as well as to the more superficial parts of wounds. The method, however, has certain disadvantages. The tubes generally used are perforated with round holes for some distance from the closed end, and if there be much resistance to the exit of fluid at the deepest part the solution finds its way through the openings nearer the surface of the wound and so the deeper parts are not reached.

These tubes, too, act to a certain extent as drains. Pus finds its way into them through the openings and is washed back into the wound again when fluid is allowed to flow. Another disadvantage of the method is the necessity of keeping the patient still. Movement on his part is apt to cause the tubes to be drawn out of the wounds, and it is not at all an uncommon experience to find tubes that were originally inserted deeply into a wound lying only just under, or even on, the surface.

Attempting to improve on this, I have found the following method of much service. Taking a piece of drainage-tube about 8 or 10 inches in length and of calibre about equal to that of a No. 8 catheter, the end is securely closed by a ligature and a small oblique incision made with sharp scissors as near as possible to the closed end. The incision should cut a small valve with apex directed towards the closed end—the more oblique it is the better—and should at its base divide one-third of the circumference of the tube (see figure, A). This incision will be found to act as a most



efficient valve, opening under very slight pressure from within and preventing any regurgitation of pus or of the irrigated fluid. The tied end should be inserted to the very depth of the wound and the free end of the tube left projecting through the dressings; the number of tubes used must depend on the size and character of the wound, but it will generally be found that one, or at the most two, will suffice.

In cases of a perforating wound of a limb or of a wound with two openings widely separated a very useful modification is to ligature the tube at its centre and cut a valve on each side of the ligature and pointing towards it (B). This is passed through the wound and the irrigation done from both ends. In this way any fluid that is irrigated into the free ends of the tube must certainly find its way to the very bottom of the wound and from there towards the surface.

To secure the tubes in position a useful plan is to make a small independent incision through the skin near the edge of the wound just large enough to grip the tube without occluding its lumen, and the free end of the tube is drawn through this after the tied end has been passed to the bottom of the wound. The free ends of the tubes are left outside the dressing and the irrigating fluid passed into them by means of a glass syringe. Gravity alone will generally suffice, but, if necessary, a little assistance may be given by using the plunger of the syringe. If only a small quantity of fluid be used at a time the dressings on the wound need only occasional changing. I have been using flavine for this purpose. One to two drachms of a 1 in 1000 solution is injected through the tubes twice in 24 hours, and the results in some very septic cases have been most satisfactory.

A question on which I have not yet been able to satisfy myself completely is whether wounds treated in this way should be drained. If free drainage is provided, the antiseptic fluid very readily finds its way to the surface and is absorbed by the dressings, and so is not able to remain in contact with the real surface of the wound. I have sometimes thought that the best results have come about when the drainage is not free. The walls of the wound then remain open and the mixture of pus and antiseptic fluid is brought into contact with the suppurating surface at all points.

Clinical Notes:
MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

MEMBRANOUS CONJUNCTIVITIS FOLLOWING A SQUINT OPERATION.

BY S. JOHNSON TAYLOR, M.B.EDIN.

RECENTLY I performed an advancement cum tenotomy operation for a convergent squint, in a girl aged 11 years, followed by a complication which I believe to be very rare. I used three stitches for the advancement and one for the tenotomy part, which I did, as usual, by the open method. All went well. Two days later the upper eyelid was a little more swollen and glazed than is usual and the advancement-wound region did not look quite nice; this was soon succeeded by a definite dirty membranous area which I diagnosed clinically as diphtheritic, the tenotomy-wound area quite escaping. I at once had antitoxin injected hypodermically and used quinine lotion freely and frequently, as advised by Sir John Tweedy in "Diphtheritic Conjunctivitis," and slowly the condition cleared up; the stitches became very loose and either were cut out or came away. The sloughy membranous patch involving the tendon and distal end of the external rectus was loth to disappear and did so very gradually, leaving a swollen granulation patch and a convergent squint as marked as before the operation. The general systemic disturbance was very slight. No bacteriological examination was made or was necessary, the clinical condition being quite sufficient to label the disease. The patient had diphtheria last Christmas and two other of the children had it, and the baby with cleft palate has been for some weeks—before the operation—and still is in our isolation hospital as a carrier of the complaint.

The ground behind the patient's house is soaked with sewage, there being no drainage system there. I have mentioned this case to several of my London colleagues, but can find no parallel thereto. The one attack of general diphtheria did not confer any immunity against the local affection. I venture to state that this complication of a squint operation is excessively rare if not unique.

Norwich.

THE CLINICAL MANIFESTATIONS OF A DOUBTFUL CASE.

BY M. J. PETTY, M.B. CAMB., F.R.C.S. ENG.

THE following case is recorded as a problem in diagnosis.

Patient, girl, 6 years of age. No evidence of other cases in family. Mother and father both healthy. When patient was 2 years of age a slight fit, with loss of consciousness, occurred; apparently complete recovery. Four months later the child began to drag right foot along the ground, since then progressively getting worse till whole of right side of body was noticed to be affected. Occasional

vomiting occurred. Bowels always regular. A week ago she had another fit, leaving an apparent palsy of all the eye muscles. Vomiting took place occasionally. I was called in to see the child, as it was supposed that symptoms, &c., were due to a tumour near the quadrigeminal bodies.

State.—The child in poor general condition, lying in bed on right side, and complaining of localised pain over left occipital region which had been present for four days. Mental condition quite clear, but speaks in a monotone and answers quickly and rationally. The right hand is held in left hand, and moved about by latter. Head measurement 50½ cm., regular in shape. Examination of cranial nerves: 1. Smell sense delicate—not the slightest impairment. 2. No change in optic nerves and fundi; fields of vision normal. Vision normal. 3, 4, 6. Right side: Pupil dilated and movements in all directions impaired; moves more than left. Slight exophthalmos. Left side: Eye apparently immovable, but on persuasion child moved eye slightly in all directions. Reaction to light good; reaction to accommodation could not be determined. 5. No loss of sensation. 7. Supranuclear lesion on right side; left side apparently normal. 8. Hearing normal on both sides. 9. Taste normal. 11. Unaffected. 12. Deviation to right side when tongue is protruded.

Right arm: Kept flexed over chest. Some active flexion and extension of elbow and distal joints. Grasps hand well but weakly. Tendon reflexes absent. No loss of sensation. Arm, forearm, and hand muscles definitely atrophied. Left arm: Loss of tendon reflexes, but otherwise normal in all its movements, not showing an intention tremor. Trunk: Normal sensation. Abdominal reflexes right side are absent, but are brisk on left side. Sphincters normal. Right lower limb: Definite paresis compared with left. Knee-jerk absent; other tendon-jerks also absent. No ankle clonus. Hallux erectus present. Definite disuse atrophy present; limb is 2·5 cm. shorter than its fellow. No loss of sensation. Left lower limb: Stronger than right. Movements well coördinated. Knee-jerk and other tendon-jerks absent. Ankle clonus absent. Babinski's sign: Extensor response.

No scoliosis. Definite contracture of post-vertebral muscles in occipital region. Wassermann reaction negative (two occasions). Cerebro-spinal fluid not examined. Urine normal. T. about 99° F. at night. P. 120. Heart, lungs, and abdominal viscera normal.

Fits, intense headache, occasional vomiting, and the eye symptoms suggested intracranial pressure, but of this there was no evidence on further investigation. Friedreich's disease, with which much of the condition agrees, is excluded by the absence of definite ataxia and of hereditary transmission.

Buenos Aires.

PETROLEUM IN THE TREATMENT OF PYORRHŒA ALVEOLARIS.

BY H. J. CORIN, L.D.S.

THE treatment of pyorrhœa alveolaris should be undertaken by the dentist only in conjunction with the patient's medical adviser, since pyorrhœa is now commonly acknowledged to be aggravated by, if not actually due to, causes other than dental. It is, for instance, in many cases primarily induced by the absorption of toxins from a septic small intestine, a condition which obviously needs skilled medical attention.

For such a condition purified petroleum is used widely and successfully, both in those cases where surgical interference is necessary, and also in those more common instances where no operation is required. Most probably the therapeutic action of petroleum is known to the vast majority of medical men; but I would like to emphasise the caution given some time ago in this journal after various investigations,[1] that only the purest oil should be administered.

In a case where there was only a slight discharge of pus from the gums, one course of local treatment, the use of an effective mouth-wash and the patient ordered to take petroleum emulsion, produced a complete cure. The patient was unable to come to town for six weeks after treatment, but seen at the end of this period there was absolutely no trace of discharge.

For long-standing cases where there is a large discharge I have found petroleum with guaiacol to give wonderful results in clearing up the conditions quickly, and when there is acute gingivitis petroleum with salol is useful. After my experience I can confidently recommend this method of treatment as effective in many instances where other methods have failed.

Old Burlington-street, W.

[1] Vide THE LANCET, Oct. 2nd and 16th, 1915.

Reviews and Notices of Books.

Organic to Human: Psychological and Social. By HENRY MAUDSLEY, M.D. Lond. London: Macmillan and Co., Limited. 1916. Pp. 386. Price 12*s.* net.

THIS latest work by Dr. Maudsley is fully worthy of the high reputation that has for long placed him in the front rank of contemporary scientific thinkers and writers on mental processes in health and disease. His first book, the "Physiology and Pathology of Mind," published hard on half a century ago, showed his mastery of all then available knowledge of the structure and functions of the human nervous system, no less than his signal capacity for thinking scientifically. It contained, moreover, the germs of much that its author has since from time to time given to us in his well-known works expanded and illustrated by further experience and mature reflection. Even as Dr. Maudsley's earliest work drew the attention of philosophical thinkers more than that of practising medical men, so probably will this latest book appeal mainly to the scientific student of psychology and sociology whether without or within the ranks of the medical profession; It must, indeed, be considered chiefly as an important contribution to the still vexed controversy between the warring schools of "materialists" or "mechanists" on the one hand, and of "vitalists" or "spiritualists" on the other. Justly pre-eminent though Dr. Maudsley is as an authority on the subject of insanity, and much as his other work owes to his practical knowledge and experience in this special study, his most enduring title to fame will be that of the scientific philosopher who in his day and generation consistently and persistently upheld the principle of the unity of the human organism and its continuity with the rest of Nature's processes.

"A true psychology" (says Dr. Maudsley in the first chapter of the book before us) "must be founded on a clear and distinct recognition of the essential continuity and constant flux of things in which all so-called causes are effects and all so-called effects causes: mind be conceived in thought as a part of the nature which its organisation is in fact. Continuity of motion without end, the perpetual flux which such old Greek philosophers as Democritus, Heraclitus, and Epicurus insisted on, and Lucretius poetically expounded, that is the fundamental fact: the world never the same for an instant, nor two minds ever the same, nor any mind ever the same for a single hour."

Again:—

"Into the composition of every idea, of every mood, of every act, of every reflection, every organ and every gland of the body has entered essentially; the minutely different structures and physico-chemical changes and exchanges of the parts in different persons producing different temperaments, and the signally special organs of male and female bodies different mental qualities requiring their special direction of development and function. To deride the notion of mechanism as anywise applicable to life and life in mind is the natural error of him who, ignorant of the exquisitely subtile physical and chemical precesses at work in the simplest vital substance, thinks grossly only of inert matter and its mechanism as exemplified in the structure of a wheel-barrow or a steam-engine."

One more quotation must suffice for the purpose of indicating some of the main lines of thought in this book:—

"That all positive intelligence is sense-evolved, though true, is not the whole truth: motor reactions contribute as essentially as sensory impressions to the construction of a mental organisation and fitly respond to them in the complex composition of ideas and judgments. The old saying, *Nihil in intellectu quod non prius in sensu* might indeed be fitly supplemented by the addition of *et in motu*."

It is clearly apparent that no adequate criticism of the main arguments of this book is possible within the limits of this notice. Even to attempt it would involve a useless plunge into a troubled sea of dispute. But this much may be said in some justification of the high degree of value which we attribute to it. The least biassed thinker on matters psychological, who is dissatisfied with any theory concerning mental phenomena which involves the importation of a purely imagined and unverifiable agency in explanation, but still may find some difficulty in regarding such phenomena as natural products of organisation, is at least likely to discover, after carefully studying Dr. Maudsley's book, that part, if not all, of his difficulty is lessened or removed. The case for

physiological or mechanistic, as against that of any form of vitalistic psychology barring the way to further inquiry by the assumption of some inscrutable agency outside all natural processes, has rarely, if ever, been stated so clearly.

It must be noted that most modern biologists will disagree with Dr. Maudsley in the view which he still holds, in common with that of Spencer, that mental organisation has been evolved by the successive registration of individually acquired ideas in the hereditary constitution of the race. But it is not needful to enter into the dispute about the modes of reproduction of so-called "acquired" qualities in order to form a due judgment as to how far Dr. Maudsley's main position depends for its validity on the views he holds on this point. A careful study of this book will show that even were Dr. Maudsley an opponent of the Spencerian doctrine his main conclusions would not lack due support. The view that mental action is a function of the organised nervous system may be held consistently by Darwinians and Lamarckians alike.

Every chapter of this book is highly interesting, instructive, and full of suggestive thought, revealing the same mental vigour that marked his first volume, the study of which was recommended by the late Walter Pater to a candidate for classical honours at Oxford as a help to straight thinking.

JOURNALS.

Journal of Anatomy. Conducted, on behalf of the Anatomical Society of Great Britain and Ireland, by Professor THOMAS H. BRYCE, Professor EDWARD FAWCETT, Professor J. P. HILL, Professor G. ELLIOT SMITH, and Professor ARTHUR KEITH. Vol. LI., Part III. April, 1917. London: Charles Griffin and Co. Annual subscription, 21*s.* post free.—A high level is reached in the present issue of this journal, and the society is much to be congratulated upon the fact that the war-time work of anatomists in Great Britain and Ireland, as echoed in its Journal, has placed recent issues increasingly ahead of those produced in the calm years before 1914. The long paper on the Development of the Hypophysis Cerebri, Pre-oral Gut, and Related Structures in the Marsupialia, by Miss Katherine M. Parker, has been accepted as a D.Sc. thesis by London University. It emanates from the laboratory of Professor J. P. Hill, of University College, London, and makes another addition to our knowledge of the anatomy of a dying fauna, the proper understanding of which owes so much already to the same fostering care.—Dr. W. Colin Mackenzie adds another paper to his Studies on the Peritoneum and Intestinal Tract in Monotremes and Marsupials, and apart from the record of the conditions present in these animals there are the deductions of a medical man accustomed to look for explanations of human conditions in the phases of phylogeny displayed in lowly creatures.—A paper of clinical as well as anatomical interest is that of Dr. J. S. B. Stopford, which constitutes Part III. of his Investigations on the Arteries of the Pons and Medulla Oblongata. This is a sound anatomical contribution to practical medicine and surgery, and we should like to see all three parts published as an entity for the use alike of anatomists and clinicians.—In the same category falls the contribution of Captain J. L. Aymard, R.A.M.C., upon Some New Points on the Anatomy of the Nasal Septum and their Surgical Significance, for this, too, is a paper which applies the findings of pure anatomy to direct surgical utility. Dr. Una Griffin at the Cambridge Hospital, Aldershot, cut and fixed for Captain Aymard some sections of the septum of the sheep, in one of which the complete circulatory system of cartilage is exemplified, the specimen showing distinct canals leading to the centre of the cartilage.—Dr. S. Rutherford Macphail adds a short but useful note on the length of the vermiform process in 220 consecutive post-mortem examinations. He finds that the average length is 99·2 mm. (3·97 inches), and that in the male the process is slightly longer than in the female.—Professor M. Amin Abdel Rahman, of Cairo, gives an account of a case of complete transposition of the viscera in an aged Egyptian male subject.—The Proceedings of the Anatomical Society are appended to this issue, and apart from their value as a record of the work of the society they contain a résumé of Professor E. Fawcett's communications on the developing chondrocranium. This résumé, brief though it is, constitutes the best published account of the stages of early skull formation available to students at the present time.

Reports and Analytical Records
FROM
THE LANCET LABORATORY.

INTRAMUSCULAR GALYL.

(THE ANGLO-FRENCH DRUG COMPANY, LIMITED, GAMAGE BUILDING, HOLBORN, LONDON, E.C.)

HITHERTO galyl for intramuscular injection has been given with an oily excipient which had certain well-known disadvantages; the absorption was relatively slow, the application was inconvenient, and frequently gave rise to pain. Galyl is now prepared for intramuscular injection in the form of a sodium salt in a weak solution of glucose and is identical with the intravenous preparation as to effect and dosage. The preparation is a brown fluid contained in ampoules of 15 cubic centimetres capacity. We note that there is some separation of oily globules in these tubes. As is well-known, this organic phosphoric arsenic compound has been used in the abortive and therapeutic treatment of syphilis, recurrent typhus, and sleeping sickness. Clinical reports of the cases have appeared from time to time in our columns.

INSECTICIDES.

(LAWSON AND CO., LIMITED, ST. PHILIPS, BRISTOL.)

Considerable attention has been given of late to effective and convenient insecticides and particularly to muscicides, and the preparations under notice, all of which are of an oily character, have given good results on practical trial. Lawson's fly spray has the fluorescent appearance of heavy petroleum and is a perfectly clear reddish-brown oil with agreeable smell. It contains a well-known essential oil, is pleasant and cleanly in use, and sprays effectively in a good atomiser. It is an excellent application for refuse heaps and destroys larvæ. The wood-oil emulsion is a dark-brown fluid, not soluble in, but mixing with, water on vigorous shaking. It has the agreeable smell of wood creasote and is adapted for domestic purposes where a heavy oily preparation is not suitable. "Carbo fly" is a dark-brown mobile fluid with an empyreumatic odour resembling wood-tar or turpentine. It is neutral to test-paper and is a much thinner fluid than the other preparations, and is therefore easily diffused. Added to the list is an oil known as "para-quit," which has been used in pediculosis. It has a strong blue fluorescence resembling heavy petroleum and possesses an aromatic odour of wood-tar. It is stated to have been used with success as the basis of an ointment supplied to the troops in the field.

TEEKOE.

(J. LYONS AND CO., LTD., CADBY HALL, KENSINGTON, W.)

Teekoe is suggested as a substitute for tea, coffee, and cocoa, and as it is much cheaper than these commodities the suggestion is worth some attention. Made in the same way as tea it yields a clear brown liquor which has a slight but attractive bitter taste resembling that of the cocoa-nib. It is important to note that this infusion contains an appreciable amount of theobromine, which, as is well known, is closely allied to caffeine, the alkaloid of tea to which the refreshing and stimulating properties of tea are largely attributed. We extracted from "teekoe" just 0·5 per cent. of theobromine; it also contains 5·40 per cent. of fat. The preparation yields 27·3 per cent. of soluble matters to cold water. It is practically free from tannin, the popular bugbear of tea. Further, it may be tolerated by those with whom the better known beverages may disagree, whether or no tannin plays a part in their trouble. The basis of the preparation is, according to our examination, ground cocoa shell. We remember this being used for the production of a beverage some years ago, and now that tea and coffee are costing very much more than they did before the war those bent on economy might be induced to give this substitute a trial. It certainly contains more nutritives than tea or coffee.

IMPROVED IMMERSION OIL.

(FLATTERS AND GARNETT, LTD., OXFORD-ROAD, MANCHESTER.)

This oil is introduced to replace the continental supplies of "thickened cedar-wood oil," and it answers the purpose of an immersion oil in microscopical examination admirably. Its refractive index is 1·510 at 30° C.; it keeps clear even in the cold, is easily removed from the slide, and does not readily dry. It shows a neutral reaction when tested with litmus paper.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 1, 1917.

The Future of Medical Education.

"I TAKE it," said HUXLEY, "that the whole object of education is in the first place to train the faculties of the young in such a manner as to give their possessors the best chance of being happy and useful in their generation, and in the second place to furnish them with the most important portions of that immense capitalised experience of the human race which we call knowledge of various kinds." HUXLEY was speaking of the essentials of education without regard to specialisation. He was considering, in fact, how the young could best be trained, so that having become possessors of "most important portions of ..... capitalised experience," they could turn their acquisitions to a good account for the race and incidentally for themselves as citizens. We published last week in the Students' Number of THE LANCET a guide to the various curriculums by compliance with which the medical student is transformed into the medical practitioner. In considering these various educational schemes, which, though differing in detail somewhat, are of the same general and standardised pattern, we are led to ask how far this pattern complies with HUXLEY'S requirements.

The feeling among many thoughtful teachers, both those concerned only and those not concerned at all with medical education, is one of dissatisfaction with the existing scheme, even while allowing its virtues, and, in particular, its possibilities. A glance at what is required of the medical student to-day, as set out in our Students' Number, explains that feeling, which is founded upon the knowledge that the curriculum is too crowded. This is shown by the number of candidates for admission to the medical profession, who, failing in the early tests, lose their stride in the race, and take as much as 15 per cent. of the years when they might be doing a man's work in obtaining the hall-mark qualifying them to do that work legally. In most cases of this sort the education which the student received in the ordinary manner at a secondary school proved not to be designed to assist him in his future specialised or professional education. There is no common opinion among educational authorities that we have here the only, or even the greatest default in the education of the medical student, for a certain number of such authorities, in pointing to the success of a few, and sometimes reminiscent of their own academic achievements, would have us believe that the possession of considerable academic knowledge, classical or mathematical, is the ideal introduction to medicine. But those who think so now must be small in number and blind to the impossibility of working out any general plan of medical education on a foundation which takes so long to lay, which is often so untruly laid, and which is so little adapted for erection thereon of applied medical knowledge. That literæ humaniores and pure mathematics form the necessary basis of both the literary and the logical sides of the study of medicine no one denies—they stand in this relation to specialised knowledge of every description; but alongside of their study, in the case of the medical student, there must be room for the pursuit of general applied science, for it is on the application of his familiarity with the main teachings of natural philosophy that comprehension of medical principles depends. When the medical student has obtained an education based on the public school ideal—which does not mean the public school average performance—he finds himself devoid of acquaintance with a whole set of important subjects which he must master before he can confine his efforts profitably to medical fields. He must have certain branches of general science at his finger's ends before he can realise what the science of medicine is, or what is the significance of any problem in pathology. If the cult of classics and pure mathematics is allowed to comprise the medical student's education until he leaves school, so that he wants at least another year in which to grasp the principles of natural philosophy before he arrives at anatomy and physiology, which sciences in their turn are to make pathology have a real meaning for him—if all this, medical education must remain a very long business; and that is exactly what cannot be contemplated calmly at this moment, with the lessons of war staring us in the face.

There can be no doubt in our mind that while between the ages of 14 and, say, 17 all education should be primarily directed to the training of faculties on some general system, at 17 those who are able to make up their mind that they intend to adopt the profession of medicine should find it possible to take advantage of a scheme of specialised training. At all public schools the study of formal science ought to be made available after the age of 16 or so; in this way the able and intelligent boys who have the intention or the bent to become medical men would receive in their scientific training that sort of systematic instruction which they would be receiving if they had pursued a classical or mathematical course—that is to say, if they had followed what is really the specialised course of many schools. There will always be a number of men who acquire medical knowledge after having gone very far in other directions, and it is a capital thing that there should be such, for more than often, when they have covered themselves with school and university honours, they proceed to adorn our ranks particularly; but this fact ought to be regarded as the extraordinary way of achieving distinction in the profession of medicine, and not as an argument for making the careers of these exceptions the pattern for our medical students in bulk. Our students must be able to start earlier on their special work, and with a more firmly laid foundation, but this is not to say that the general education of their youth is to be neglected.

The training of naval cadets, which used to commence almost in the nursery, and even now deals with material selected when very young, has been taken by educational experts as a proof alike of the good and the evil that may emerge from early specialisation; but the opinion of many who have given great attention to this matter is, we believe, that the individual officers would benefit, and that the Navy would not suffer, if the time-limit for entrance into the Senior Service were raised by as much as three years. To us it seems that this is probably true, and that the age thus suggested—namely, 16½ to 17—is about the age when schoolmasters, parents, and boys themselves might well be asked to decide if the boys intend to become medical men. And if the answer is in the affirmative these boys should have the opportunity while still at school of getting the training that they want. The supply of medical men will be an urgent consideration for the General Medical Council at the termination of the war. As the standardising authority over the medical education of the whole of the country the Council must, of course, do justice to those parts of the country where the facilities for scientific training are hard to come by, and this is a matter which, it will be at once admitted, bristles with difficulties. But the difficulties should be attacked. At the present time, a critical time in the history of national development, our medical students are not obtaining the education postulated by HUXLEY'S wisdom—ever direct and simple; their faculties are not being duly developed, and they are not furnished at a sufficiently early stage in their careers with the capitalised experience that would be most important for their future. They make good, but with waste of time.

The Effect of the War upon Psychiatry in England.

ONE of the results of war on the colossal scale of to-day has been the appearance in military and civilian hospitals and analogous institutions of mental and nervous cases by, literally, thousands. The welcome sequel has been a quickening of interest on the part of the medical profession as a whole in these types of case, of which in many instances the medical practitioner was little qualified either by education or by previous experience to take cognisance. Not only has the specialist had abundant opportunities of increasing his knowledge, theoretical and practical, it has been gratifying to take note of the large number of useful contributions published in one journal or another by observers who would not describe themselves as expert neurologists or psychiatrists. Indeed, it is this latter fact that is significant, for it may mark the beginning of a general movement for the abolition of a long-standing reproach. The medical profession, including many of its younger members, has been brought into contact with phases of mental and nervous disturbance to a degree hitherto impossible; has realised its lack of learning, its unfamiliarity with the subject, due in part at least to seriously inadequate teaching; and as a result has determined to acquire information while the occasion continues. An outcome of this revived interest is undoubtedly the expression of dissatisfaction with the existing methods of handling such cases in civilian life. We do not misrepresent the situation when we state that the average neurologist has, as a rule, been preoccupied with organic nervous disease to the exclusion of functional disease; while the psychiatrist, attached to an institution, has had little or no chance of studying, and no incitement to study, mental disease in its early manifestations. A hard-and-fast line cannot be drawn between the two sister branches, but an important group of borderland cases, coming, theoretically, under the purview of one or other, has been in large part, intentionally or unavoidably, ignored. Not otherwise can we explain the persistence of the gross anomalies and unworthy neglect still characterising the measures in vogue for dealing with such cases. In our columns [1] we have repeatedly drawn attention to the inferior position we occupy among the nations in our attitude towards psychiatry. And we know well it has been a bitter experience for those who have laboured to remedy these defects that so little has been accomplished.

But the war is changing things. Special medical boards have been appointed to deal with neurasthenic cases, and the retention in or discharge from the army of the victims of shock and nervous disturbance. Everywhere the practitioner of medicine is meeting with the "shell-shocked" soldier, and though he may be conscious of his own inability to treat such a case out of a full experience, at least it is borne in on him that the patient cannot be left to his own devices. The determination to deal with such cases adequately has been manifested both by the medical profession and the public, and the outcome of their awakening has been the establishment of a number of special hospitals all over the country, some of them due to private generosity, as in the case of Mr. JOHN LEIGH'S recent gift of Brooklands, near Manchester. These are doing excellent work and achieving praiseworthy results, but the problems of "shell shock" are neither new nor mysterious; they are the everyday problems of "nervous breakdown." The admission of the necessity of places for the suitable reception of such cases when occurring in the Navy or Army, and their prompt organisation, have painfully emphasised the insufficiency of our present methods for dealing with such cases in civil life and the unjustifiability of our neglect. In this connexion we wish to draw our readers' attention to a small book, recently published, with the not sufficiently indicative title "Shell Shock and its Lessons." [2] The lessons which this book sets out to inculcate all go to prove the urgency of reforming our treatment of the mentally afflicted. For the authors find that exactly here mediæval traditions are still encumbering English psychiatry; indifference

[1] THE LANCET, April 6th, 1912, Nov. 8th, 1913, and June 6th and Nov. 7th, 1914.

[2] Shell Shock and its Lessons. By Professor G. Elliot Smith and T. H. Pear. Longmans, Green, and Co. 1917. 2s. 6d. net.

nertia, and lack of knowledge are still all too apparent; obstacles are still being raised through our national obstinacy and our devotion to such catch phrases as the "liberty of the subject." It is an ironical comment on the situation that the little volume is written by a professor of anatomy, in collaboration with a reader in psychology who is not a member of the medical profession.

In language that is no whit too strong they pillory the British attitude towards the treatment of mental disorder, and show that the blend of apathy and ignorance with which our country has too long regarded these problems is rapidly becoming our exclusive distinction. But the war has compelled us to deal in a modern, scientific fashion with borderland cases and early mental cases among sailors and soldiers, and if our medical profession handle such cases in numbers and restore them to normal life with conspicuous success, we cannot believe that measures of this kind will be restricted in future to the Services and will hold good only "for the duration of the war." On the contrary, we are convinced that the widespread interest which part at least of the medical profession is evincing in nervous and mental disease will render any reactionary steps impossible; reconsideration of our methods of teaching and demonstrating in these subjects will follow.

The Economical Use of Medical Officers in the Army.

A COMMITTEE has been appointed by the Secretary of State for War to proceed to France to inquire into the administration of the Army Medical Service. The committee is composed as follows:—

Major-General Sir FRANCIS HOWARD (chairman),
Sir RICKMAN GODLEE,
Sir FREDERICK TAYLOR,
Sir W. WATSON CHEYNE, M.P.,
Lieutenant-Colonel H. J. STILES,
Dr. NORMAN WALKER,
Dr. CHARLES BUTTAR, and
Dr. J. B. CHRISTOPHERSON (secretary).

The committee was appointed mainly at the instance of the Central Medical War Committee, and fittingly includes in it Dr. BUTTAR, the chairman of the Executive Subcommittee of that Committee, three prominent representatives of the Committee of Reference of the English Royal Colleges, and the convener of the Scottish Medical Service Emergency Committee. Its personnel is strengthened by the inclusion of Lieutenant-Colonel STILES, and the secretary, Dr. CHRISTOPHERSON, whose professional qualifications cover between them a very large field. We are glad to learn that the investigations of the committee will be extended to the United Kingdom, for it is in the personnel of the medical officers of the Army at home that most of the debates on the economical distribution of medical service have had their origin. It is here that the particular knowledge of the Medical War Committees will have full play; and there is a good case for making the representation of the Central Committee a larger one.

Annotations.

"Ne quid nimis."

THE ORDER OF THE BRITISH EMPIRE.

AMONG the 268 appointments to the new Order conferred on "persons, male or female, as may have rendered or shall hereafter render important services" to the British Empire appear the names of five medical women and eight medical men. We give the complete list of these on p. 360. Lieutenant-Colonel Edward Stewart, who becomes a Knight Commander of the Order, is medical assessor to the Red Cross in France. The services of the five women who become Commanders have been varied and conspicuous. Dr. L. Garrett Anderson is well known as the organiser of a complete hospital unit in France, and Dr. Flora Murray as officer in charge of this unit after its return to this country and settlement at Endell-street. Lady Barrett and Dr. Mary Scharlieb have been active in socio-medical work of many kinds. Mrs. Chalmers Watson is chief controller of the Women's Army Auxiliary Corps, which undertakes important replacement duties at home and abroad. But over and above these well-merited honours for the holders of medical qualifications we are glad to see in the composition of the Order welcome signs of the increasing recognition of many important healing agencies. The matrons of four of the metropolitan hospitals—Miss M. Hogg, of Guy's; Miss E. C. E. Luckes, of the London; Miss A. McIntosh, of St. Bartholomew's; Miss A. L. Still, of St. Thomas's—along with Sister Pauline, of the Italian Hospital, are admitted to the Third Class, where the name also appears of Miss Margaret MacMillan, justly famous in connexion with open-air day nurseries. Mrs. Mabel Dease, with other officers of the Welfare Department at the Ministry of Munitions, becomes an Officer of the Order, in recognition of work as important in its wideness of range as that of Mr. R. J. Parr, director of the National Society for the Prevention of Cruelty to Children. Among the higher distinctions we are glad to see the names of Lord Sydenham, the efficient president of the National Council for Combating Venereal Diseases, and Sir Arthur Pearson (Knights Grand Cross), along with those of Mr. Cyril Jackson and Mr. A. R. Yapp (Knights Commanders), whose work in connexion with the Pensions Statutory Committee and the Y.M.C.A. huts respectively has had beneficent results on an incredibly large scale. In the person of Dame Katherine Furze, as commandant-in-chief of the Women's Voluntary Aid Detachment, that agency receives the highest official honour, which is not more than its due. The names of some well-known chemists also figure in the list. Professor Herbert S. Jackson is chemical adviser to the Optical Research Branch of the Ministry of Munitions, and the honour conferred upon him is a recognition of his admirable work in the making of optical glass. Professor H. Brereton Baker, a member of the Trench Advisory Committee, is known in connexion with the prevention and alleviation of irritant gas poisoning. The work of Professor W. H. Bragg, who is attached to the Board of Invention and Research at the Admiralty, on the structure of crystals as revealed by X ray examination and on radio-activity, has brought much of promise for the future. The first named becomes a Knight Commander, the two latter Commanders of the Order.

BUBONIC PLAGUE.

SHIP-BORNE plague not infrequently makes its appearance at British ports during the months of August and September. Last year the disease manifested itself at three seaport towns—namely, Bristol, Hull, and Liverpool—but fortunately, thanks to the energetic preventive measures taken by the port sanitary authorities, there was no spread of the malady.[1] This year there have already been two instances of the arrival of steamers at our ports with cases of plague on board, which may be briefly summarised thus:

The first of these was in May, when the ss. *Sardinia* called at Falmouth and reported that her captain was sick. The ship was from Australia, but had called at Bombay, where she loaded a cargo of grain, and also at Marseilles, where part of her cargo was discharged. On inquiry being made it was found that the captain's illness was of a non-infectious nature, but that two lascar members of the crew were suffering from what was supposed to be mumps. The ship sailed for the Thames, and the two suspected cases of mumps having died almost immediately, were forthwith buried at sea. On arrival at Gravesend three cases of plague were discovered on the *Sardinia*, one of which proved rapidly fatal, whilst the remaining two were promptly removed to the port hospital at Denton. Some days later two of the contacts developed the disease and both died. They had occupied bunks adjacent to that of one of the previous fatal cases. In the light of subsequent events, there does not appear to be any doubt that the patients who had been supposed to be suffering from mumps were really cases of plague, and, on this assumption, there was a total of seven plague cases, of which five had a fatal termination.

The second instance of the arrival of ship-borne plague during the course of the present year occurred on August 13th, when the ss. *Matiana* from Bombay arrived at Gravesend. The vessel had called at Falmouth on August 11th, but no cargo was discharged and no passengers were landed at that port. Prior to the arrival of the ship, between July 14th and 28th, nine cases of bubonic plague, with six deaths, took place among the crew, the bodies being buried at sea. Three convalescents were taken off the ship at Gravesend and removed to the port hospital, while the remaining members of the crew were kept under medical observation. Another case occurred among these contacts which resulted in the death of the patient. There were in all 10 cases and 7 deaths. The ship was detained at the official mooring station off Gravesend, and the cargo was discharged into lighters under the supervision of the medical officer of health of the Port of London Sanitary Authority.

We understand that in the case of each of the above-mentioned vessels partial disinfection of the holds had been carried out at a port of call before their arrival at an English port and before their cargoes had been discharged. There is a suggestion from these facts that the fumigation of the vessels at an intermediate port may have had the effect of driving infected rats from the holds into the living quarters of the crew, and this would account for the late development of plague on board these ships some weeks after leaving Bombay. We understand that these occurrences are being officially investigated, and no doubt the details will in due course be published. The occurrence of plague cases on board ship need not give rise to apprehension so long as the sanitary administration of the port at which the ship arrives is efficient in character and all the proper preventive measures are rigorously carried out. Such measures, of course, include prompt removal of the patients to hospital, the keeping of all contacts under medical observation for some days, the employment of means to prevent access of rats from the ship to the shore during discharge of the cargo, thorough disinfection along with destruction of rats on board the vessel after discharge of the cargo, and systematic rat destruction on the docks, wharves, and warehouses so as to minimise the danger of spread of the disease among these rodents should an infected rat escape from the ship to the shore. A sanitary survey of the ports of England and Wales is at present being carried out by the medical inspectors of the Local Government Board, the necessity for such action being well illustrated by the occurrences to which we have referred.

[1] See THE LANCET of Sept. 9th, 1916, p. 486.

INFANT MORTALITY IN AUSTRALIA.

THE report on infant mortality which has just been issued by the Commonwealth Committee on Death and Invalidity (C. 3499, Government printer, Melbourne) is a document of the greatest interest, inasmuch as it records the experience of our own kith and kin under conditions less fixed by habit and custom, and a careful study of the results cannot fail to shed some light on the solution of the same problem in this country. The report starts off with a comparison of the infant mortality rate in various countries, using as a basis the most recent available five years' average. Russia and Hungary head the list with 254 and 204; New Zealand is the lowest with 59; while the Commonwealth figure of 72 is bettered only by Norway with 70. When the Commonwealth figures are further analysed into their constituent parts, Queensland and South Australia, with 67 and 65, both excel any European country. While the rate has dropped steadily in New Zealand during the 45 years of observation, it is only since 1903 that there has been any marked decline in the Commonwealth rate, except in South Australia, where the diminution—starting from the very high figure of 158—has been nearly continuous. The fall has taken place chiefly in the urban areas, the reduction being similar in kind in the rural districts, but less than one-half the extent; the committee concluding that the same factors are operative in each but to a differing degree. It is very striking that the reduction has scarcely affected the rate for infants under one month old, which remains practically what it was, and always higher for boys than for girls. In New South Wales, indeed, the first week of post-natal life has increased recently in risk. The committee naturally attribute this early mortality of the new-born child to the working out of ante-natal causes, and devote a deeply interesting section of the report to a discussion of these causes. They agree in the main with the conclusions of Dr. Whitridge Williams, of Baltimore, who found syphilis, "unknown causes," difficult labour, prematurity, and toxæmias to account for 75 per cent. of the early deaths, syphilis being certainly responsible for 25 per cent. and probably for many more. The problem of controlling ante-natal causes of infantile mortality resolves itself, therefore, the report states, into (1) the control of syphilis; (2) the reduction of known causes, such as poverty and overstrain of the mother, difficult labour, toxæmias of pregnancy; and (3) further study of the large group of "unknown causes." The committee quote with approval the suggestion of Dr. W. Bruce, medical officer for Ross and Cromarty, who has proposed the confidential notification, within 24 hours, of the causes of death to the medical officer of health, in order to enable him to take any action necessary to add to scientific knowledge. They urge on the Australian Government the desirability of applying on a large scale in a selected area an experimental scheme for reducing the infant mortality on the lines of that framed and enforced

by the municipality of Villiers-le-Duc,[1] which has, so the report states, simply abolished the death-rate of infants. Of the environmental causes of mortality operating most potently in the second and third months, pneumonia and the diarrhœa groups are dominant in Australia, while after the third month in order of frequency, pneumonia, bronchitis, diarhœa, enteritis, whooping-cough, tuberculosis, and meningitis claim 75 per cent. of the total deaths. It is these environmental causes which have been reduced so largely during the last 15 years. Australia may rest assured that we shall watch with interest the result of her efforts in the solution of the problem.

A NEW TREATMENT OF AMERICAN LEISHMANIASIS.

Dr. Edmundo Escomel, of Arequipa, Peru, has published a pamphlet from Buenos Aires detailing the promising results which he has obtained in the treatment of cases of American leishmaniasis with a solution of oxide of antimony in water and glycerine as prepared by Mr. W. Martindale, of London. Dr. Escomel notes that this solution keeps better than tartar emetic solution, that it can be administered subcutaneously, intramuscularly, or intravenously, and that no untoward general or local irritating reaction or complication was observed to follow its injection by any of these methods. The record of the history and treatment of one of his successful cases is accompanied by photographs showing the appearance of the facial lesions before and after the course of treatment. In this case there was extensive ulceration of the patient's foot; six months after the onset of the disease, when treatment was begun, the secondary lesions (which had started from the skin near the lips and contour of the nose) had invaded the whole nasal mucous membrane and the back of the palate. The treatment was as follows:—

On Sept. 10th, 1916, a subcutaneous injection of 1 c.c. of the oxide of antimony solution. On the 12th, 16th, 18th, 21st, and 24th intramuscular injections of 1 c.c. of the same solution. On the 26th, 28th, 30th, and Oct. 3rd intravenous injections of 1·5 c.c. of the same solution. On the 5th a subcutaneous injection of 1·5 c.c. of the same solution and a local application of tartar emetic powder to the nasal mucous membrane previously anæsthetised. From this date until Dec. 5th a repetition of the treatment as recorded above. On the 6th an intravenous injection of 1 c.c. of the oxide of antimony solution and on the 7th an intravenous injection of 2 c.c., together with a second local application of tartar emetic powder to the nasal mucous membrane. On the 9th an intravenous injection of 2 c.c. of the oxide of antimony solution, and from this date until Dec. 24th intravenous injections of 1 c.c. In addition, on the 23rd and Jan. 2nd the patient was given "massive" injections of 6 c.c. of the oxide of antimony solution without any untoward local or general reaction being produced. Cicatrisation of the facial cutaneous lesions commenced on Dec. 6th, and by Jan. 2nd the cure of these lesions was complete, but the injections were continued throughout January and February to complete the cicatrisation of the mucous membrane. The extensive ulceration of the foot healed completely without special local treatment.

As a control to this case Dr. Escomel describes and illustrates with photographs a case of facial blastomycosis in which the same treatment, carried on at the same time, failed to effect any improvement in the patient's condition, which became steadily worse as the disease continued its invading progress. Dr. Escomel sums up his conclusions as follows: (*a*) The solution of oxide of antimony in water and glycerine has cured the cases of American leishmaniasis in which it has been used; (*b*) it does not produce the general effects nor the local irritant effect of tartar emetic; (*c*) it keeps well for a long time; (*d*) for these reasons it appears to be indicated as a substitute for tartar emetic in the treatment of American leishmaniasis; (*e*) up to the present it has not cured cases of blastomycosis; (*f*) in mixed cases of leishmaniasis and blastomycosis—which are rather frequent—the therapeutic effect is observed on the leishmania affection only, and, after an apparent improvement, the disease continues its slowly invading progress as a result of the blastomycosis, which alone remains.

[1] THE LANCET, 1916, i., 943.

SELF-INFLICTED INJURIES AMONG SOLDIERS.

Professor Attilio Ascarelli, of the Headquarters Military Hospital, at Rome, has published[1] some interesting observations based on his personal examination of several hundred cases during the last two years among soldiers suspected of suffering from medical or surgical ailments voluntarily inflicted or simulated. The study of the exceptional causes which lead soldiers into this special kind of crime shows them to be many and various. At the front there are met with especially forms of minor injuries sufficient to cause withdrawal from the fighting line to a base hospital, and each form of injury may assume an epidemic, almost contagious, aspect, so that one special lesion becomes predominant in a certain section of the troops, at first by the occurrence of a few cases which are often passed unrecognised, then by the rapid multiplication of similar cases and their abrupt cessation when the similarity and abundance of examples render the fraud manifest. Cases in the interior, on the other hand, are endemic rather than epidemic, are more numerous in one place or another, assuming sometimes one form, sometimes another. The contributing factors in these cases are complex. For example, instances are of more frequent occurrence in cities than in rural districts. The predominant political feeling also determines their occurrence in certain localities, while social condition seems, on the other hand, to exert but little influence. Family conditions are of some importance; sometimes it is the father of a large family, sometimes a soldier who has had a brother killed in action, sometimes penurious family surroundings, induce the resort to fraud in order to avoid military service, while at other times it may be the result of nostalgia. These injuries are relatively more frequent in young adults than in those habituated to camp life, are more numerous during the days following a new levy, and are most numerous in the recruit who is overpowered by fear of the unknown, while later on he gradually adapts himself to his new life. A feeling of impunity is of particular importance, the military culprit pays little heed to the condemnation awaiting him after the war, and sometimes does not hide the fact that he has been able by these means to obtain exemption for some months, so much so that relapses occur in the same hospitals where such cases are treated and some who have even been punished by the authorities return later on with the same or some other form of self-inflicted injury. In about one-third of the cases the existence of former wounds or diseases supplies the impulse which determines the injury, a small wound completely healed constitutes an admirable substratum for the application of some caustic; a contusion or sprain

[1] Il Policlinico, May 23rd and June 3rd, 1917. Practical Section.

suggests the production of more permanent swelling by means of tight bandaging; a conjunctivitis or otitis contracted in childhood affords an explanation and excuse for the same conditions wilfully induced. A further cause is to be found in the leave granted during winter or after convalescence, the soldier who returns for a longer or shorter time to his family surroundings is tempted at the expiration of his leave, and often under the advice of evil companions, to resort to questionable practices. The most frequent injuries met with by Professor Ascarelli were:—

(1) Inflammation and abscess due to the injection of chemical substances such as petrol, benzine, turpentine, and chloride of lime generally into the calf, knee, or heel. Sometimes on puncturing such abscesses an odour corresponding to that of the substance injected was observed. (2) Abscess from injection of fæcal matter, the nature of which may sometimes be detected by the fæcal odour of the pus and the presence of a raised spot at the site of puncture. (3) Chemical cauterisation, usually by soda or potash lye, sulphuric or hydrochloric acid, aqua regia or chloride of zinc; the diagnosis is not difficult, but a general examination is necessary to exclude any condition that might explain the occurrence of the ulcer, such as syphilis, diabetes, syringomyelia, varix, &c. (4) Burns, caused by boiling water or lye, the shape and size of which often do not tally with the cause given in explanation. (5) Hard œdema, a kind of cellulo-dermatitis produced by self-inflicted blows frequently repeated, generally on the back of the hand or foot, the anterior part of the thigh, or knee. The region appears swollen, elevated, more or less regular in outline, and cyanotic. X ray examination is always negative. (6) Œdema from stasis produced by tight bandaging. (7) Otitis caused by the introduction of irritants, generally grafted on a real chronic otitis. The presence of lesions in the meatus and concha may reveal its artificial nature, which may result in stenosis or even facial paralysis. (8) Conjunctivitis caused by castor-oil seeds and other irritants. (9) Dermatitis from plants—i.e., the roots of ranunculaceæ and euphorbia. (10) Voluntary mutilation by firearms, seen almost exclusively in the war zone, in which blackening round the wound of entrance forms a guide as to the true cause.

Professor Ascarelli believes that only a small minority of the soldiers who come under medical observation for self-inflicted injuries exhibit definite criminaloid tendencies, but draws special attention to the marked hypoalgesia associated with such cases, which can be demonstrated by the absence of painful impressions, dilatation of the pupils or acceleration of pulse, when the patient is subjected to the application of strong faradism.

THE UNITED STATES PHARMACOPŒIA.

THE conditions under which the national pharmacopœias are revised in the United States of America and in this country differ fundamentally, but the question whether the American system is preferable to our own is hardly one that can be discussed profitably at the present time. Another question which need only be stated just now is whether in Great Britain sufficient is done through private channels to explain lucidly to prescribers the changes that are introduced in succeeding editions of the Pharmacopœia or whether private enterprise could with advantage be supplemented, as in the United States, by official efforts. The excellent publications issued in this country in the wake of a new Pharmacopœia—as, for instance, Martindale and Westcott's Extra Pharmacopœia, Squire's Companion, and the British Pharmaceutical Codex—would seem to provide all that could possibly be needed in the way of guides to medicines, and it is at least doubtful whether any Government department could furnish anything better. In the United States, however, the Public Health Department does what in this country is done unofficially; but the official publication of the United States is neither so prompt, nor in our view so serviceable, as are those British publications to which reference has just been made. The volume (Hygienic Laboratories, Bulletin No. 107) before us consists of a digest of the changes and requirements included in the Pharmacopœia of the United States (ninth decennial revision) and in the National Formulary (fourth edition). Like the majority of official books, it looks official and lacks an inviting appearance, both generally and in detail. That it serves its useful purpose, however, we do not doubt. As the preface observes, "The publication of new editions of the established books and standards of medicines is of necessity accompanied by an element of uncertainty because of the many changes in the number and kind of drugs and preparations described therein, and also because of possible alterations in strength and nomenclature of widely used preparations." Hence the need on the part of the busy official, doctor, chemist, or pharmacist for something to show at a glance the present status of any official or recently official drug or compound included in the present editions of the United States Pharmacopœia and National Formulary and the immediately preceding editions. The volume, in fact, is designed to serve as an index to the several recent editions of the United States official standards, and this it does effectively.

THE BACTERIAL CONTENT OF A BATTLE-SHIP'S AIR.

IN the *Archives de Médecine et de Pharmacie Navales* for April and May, 1917, Dr. Candiotti, médecin de première classe (staff-surgeon) of the French Navy, gives an account of his investigations, before the war, of the bacterial content of the air of a French ironclad. He drew a large volume of air, 100 or 200 litres, through a tube of sugared water, and, plating that out, counted the colonies which developed. He does not mention the culture medium nor the temperature of incubation, but he gives the number and character of aerobes and moulds found in a cubic metre of air from different parts of the ship. His experiments were mostly made towards evening or at night, when the air was still, sometimes with the artificial ventilation stopped. His numbers from the engine-room and stokehold are low; those from the mess-decks are higher. In one of the latter he took two samples, the first about noon, which gave 1200 aerobes, 800 moulds; the second from 8 P.M. to midnight, when the temperature was the same, but the ventilation was obviously poor. It was still weather, many hammocks were around, and a disagreeable smell prevailed. This experiment gave 3600 aerobes and only 800 moulds, the same figure as by day, while the aerobe figure was trebled. In the wireless room Dr. Candiotti found 3800 aerobes, but in the galley on the main deck 8100 aerobes, 900 moulds; in the vegetable store, two decks lower, 6900 aerobes and 12,800 moulds. In these two latter sections only did he find colonies of the *Bacillus coli*, and he suggests that this may have accounted for the diarrhœa which he noted, his observations being made in summer. The aerobes found were mostly staphylococci, and Dr. Candiotti associates with this fact the prevalence among the men of boils and small abscesses, and the tendency of abrasions to inflame. He endeavoured by guinea-pig inoculation to prove the presence of the tubercle bacillus, but was unsuccessful. Other observers have found smaller numbers of bacilli in the air of a United States

battleship, but exact comparison is impossible in the absence of information regarding the culture-media used and other details of method. The results would gain in interest if the carbonic acid content of the air at the time of examination had been given as a guide to the efficiency of ventilation, and a statement made of the number of men in the compartment and the cubic space per head.

THE CASE MORTALITY OF INFECTIOUS DISEASES.

THE report of the Metropolitan Asylums Board for the year 1916—the nineteenth year of issue—contains, among other statistical matter, an instructive summary of the average death-rates from the common infections in the Board's hospitals during successive quinquennial periods. Beginning with 1872–6, the mortality per 100 cases of scarlet fever sank period by period from 12·4 to 2·5 in 1907–11, the individual figures for the last five years being 1·6, 1·3, 1·4, 2·0, and 1·8. The similar even fall for diphtheria was from 33·6 in 1887–91 to 8·8 in 1907–11, with 6·2, 6·2, 7·9, 7·9, 6·8 as the individual figures for the last five years. Enteric fever started in 1872–6 with a case mortality of 18·6, which fell to 14·6 in 1907–11, and is only 13·1 in 1916. In the experience, therefore, of the Metropolitan Asylums Board scarlet fever is only one-eighth as fatal as it used to be, diphtheria one-fifth, and typhoid two-thirds. In striking contrast with these figures is the high level and relative constancy of the death-rate from measles and whooping-cough, 8·9 and 9·9 respectively for 1916, although it should be remembered that these have only been under observation for about ten years. Scarlet fever may be said to be well under control, diphtheria is becoming so with earlier diagnosis and antitoxic treatment; but the problems of measles and whooping-cough await solution.

THE FACT OF DEATH.

WE should have been surprised if the annotation in our issue of August 18th on death certification had not resulted in a communication from the Association for the Prevention of Premature Burial. With the medical man's omission to see the corpse Mr. J. Brindley James associates a bevy of grisly possibilities: murders may go unnoticed, insurance societies be defrauded, and unfortunate persons be buried while still alive. Without necessarily sharing these gloomy forebodings we agree—and stated so in the annotation—to the desirability of a medical man seeing any person with respect to whom death has been alleged before signing a certificate. The occurrence of death will not, except in the rarest instances, require verification by a medical man; no attendant, whether nurse or relative, at the bed-side of a sick person has any doubt about the mysterious happening when the life of the person ceases to be. No hospital sister sends for the resident medical officer to confirm the fact. The fact of death is as clear and indisputable as the fact of life. More difficulty may, of course, arise where no witness was present at the time when death was assumed. Our Paris Correspondent writes of tests applicable on the field of battle and of a new and safe conjunctival reaction. The tests for the verification of death given by the Association may easily be further elaborated and might then become so delicate as to detect local life or the persistence of signs of life in the various tissues after general death has occurred. Mr. Shiro Tashiro, who is instructor in physiological chemistry in the University of Chicago, has touched upon this subject in dealing with the chemical signs of life in a recent monograph published by the University of Chicago Press. Mr. Tashiro states that of all the signs of living processes one of the most universal is irritability, the inherent power of the living to react against a stimulation. A necessary condition for this irritability of the tissues is metabolic activity, but this in itself is not evidence of vitality. Metabolic response to an injury is the crucial test. If a tissue is alive mechanical crushing will produce a metabolic response; if it is not alive there is no response. If of two seeds or two similar pieces of animal tissue the crushed portion gives off more carbon dioxide than the other the seed or tissue is alive. By means of his biometer Mr. Tashiro claims to be able to make this distinction within a few minutes, or at all events within an hour or two. His method is one of extreme delicacy and would have been useful in exploding the myth of millennium-old living corn in mummy cases.

THE DIETETICS OF SOUND WINE.

SINCE the recent death of Professor Landouzy there has appeared in the *Journal de Médecine de Bordeaux* a letter from him addressed privately to a colleague who had written in the first year of the war asking advice on the attitude that should be taken by medical men to the public discussion concerning the use of wine by the troops. The Academy of Medicine was then about to issue a resolution to the effect that the fighting men should receive daily a ration of wine, but high authorities and public opinion alike were disturbed by fears of alcoholism which were set forth in a number of speeches and letters, and in diligently compiled statistics. Landouzy in his letter stated that he had been suspect on account of his consistent refusal to march under the banner of the abstainers. "Abstention is everywhere, particularly under the sky of France," he wrote, "a scientific, economic, and historical heresy." He deprecated the confusion between the "alcoholism" of the northern countries of Europe and the metabolic effect of a quantum of French wine supplied pure and unadulterated, adding his opinion that "natural wine ought to be given its place in the alimentary hygienic and economic ration; the ration of wine must be measured out in doses in the same way that albumin, carbohydrates, sugar, and fats are measured." To Landouzy the best way of teaching the nation to beware of alcoholism was to instruct the children in rational alimentation. He thought that every Frenchman could with advantage drink daily with his meals a litre of natural wine, which at the price of 30 or 40 centimes would supply him with 500 calories daily at a price seven times less than that of the same number of calories from the butcher. This would be of benefit to the Frenchman individually and to the country at large commercially, although he deprecated too close a connexion between commercialism and wine production. Through industrialism the pure-wine merchant was too often replaced by the "liquoriste" and the vendor of "vin maquillé." The correspondence thus started continued for some time, with the result that the Academy of Medicine passed unanimously their resolution approving of the introduction into the regulation ration of the soldier of the same quantity of natural wine as sanctioned in the Navy, with the precaution that where the authorities provided wine for the soldier he should not be able to obtain it elsewhere.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Malaria in the Near East and its Treatment.

THE large number of men invalided with malaria from the Salonika Army has necessitated the provision of special hospitals to group the cases and give them systematic treatment and care. Most of these hospitals are situated for convenience in the Marseilles district, but others are scattered up and down the country, and in the special hospital at Rueil, near Paris, accommodation is provided for convalescent soldiers who relapse and cannot be sent back to their depôt without previous treatment. The abundant clinical material has given occasion for new studies on malaria, the special forms met with at Salonika, the results of various methods of treatment. One of the most complete of these studies was presented to the Academy by Principal Marchoux, who was attached before the war to the Pasteur Institute and is now in charge of the medical service of the Place de Paris. As a result of numbers of blood examinations made at the Pasteur Institute he concludes that in the malaria of the Near East the three recognised forms of Laveran's hæmatozoon, may be found, *Plasmodium vivax* being often associated with *P. falciparum*. M. Marchoux's conclusions definitely point to quinine treatment, with regard to which he makes important observations likely to modify current principles of treatment. A dose of 1 gm. of quinine by the mouth causes a rapid disappearance of the schizonts, and may even arrest an attack when these are nearing maturity and beginning to fragment. When the schizonts are immature it is better to spread the dose over the 24 hours in four portions of 0·25 gm. in order to avoid auditory disturbance. Fragmentation then takes place in from 24 to 48 hours without producing an attack. The action on the gametes of *P. vivax* or of *P. malariæ* is definite but incomplete, and some of them continue to live. The crescents appear insensitive to quinine, dividing after an average period of 14 days by parthenogenesis and serving as the starting point for a new series of schizonts and gametes. Hence apparent recovery may be followed by a fresh attack in 14 days, or even as much as a month later if the parthenogenetic generation has been scanty. On the other hand, if the patient is the host of several generations of parasites the attacks may be weekly or even more frequent. Rational treatment aims at destroying the successive crops of schizonts until exhaustion of the gametes results. The microscope reveals parasites 2–3 days before the occurrence of fever, and by destroying them as soon as they appear complete sterilisation is rendered possible. For this several grammes of quinine judiciously employed should suffice. M. Marchoux concludes by advising the grouping of malarial cases under the same roof, protected from anopheles, where daily examination of the blood can be carried out. Men found to be free from parasites are sent to work in the fields, while others receive quinine and remain at rest. Meantime convalescent malarial cases in Paris are being invited to have their blood examined twice a week at the Pasteur Institute as a guide to treatment at the correct moment. The usual method of giving a daily dose of quinine doubtless secures against attack, but is liable to upset the digestion and is withal very costly. In practice it is sufficient to administer 3 gm. of quinine a week to deal with all generations of parasites in course of evolution, two or three days being necessary for each to develop to the point at which an attack is produced. The diurnal dose of 1 gm. is the necessary minimum, assuming proper absorption and retention in the organism for a sufficient period. For this reason except in acute attacks M. Marchoux rejects subcutaneous and intravenous injections, for by these routes elimination is too rapid. Oral medication is preferable, employing quinine salts which dissolve slowly—e.g., the sulphate and especially the basic salt, which contains 85 per cent of alkaloid.

Dr. Ravaut and his colleagues at Marseilles have confirmed the observation that except in acute attacks quinine is as efficacious by the mouth as injected into a vein or beneath the skin. These observers combine quinine with arsenical treatment, the latter being administered in the form of arrhenal, a dose of 0·2–0·3 gm. being injected on two successive days alternating with two days of treatment with 2 gm. of sulphate of quinine. Treatment lasts 30–45 days, repeated if necessary. As a preventive measure minimal daily doses of quinine are continued. M. Ravaut insists on the necessity of ensuring that the drug has actually been taken. Struck with the complete failure of the treatment in certain cases, he made inquiries only to find that a great number of patients were avoiding treatment by a thousand ruses, either fearing the auditory or gastric effects or in order to prolong their stay in hospital. He recommends a systematic urine control by means of Tanret's iodine reagent to ascertain that absorption has actually taken place, and prescribes, in the place of pills and cachets, which can readily be retained in the mouth to be spat out later, an aqueous solution of 33 gm. to the litre, of which 30 gm., or two tablespoonfuls, represent 1 gm. of alkaloid, the dose being mixed with wine. MM. Jeanselme and Dalimier have done good service in determining by exact analysis the elimination of quinine in the urine following on the various routes of administration. The intravenous method results in the most rapid appearance of alkaloid in the urine and the shortest stay in the system—viz., 27 hours. Intramuscular injection in an oily excipient gives the longest retention—viz., 60 hours. Taken by the mouth the urinary reaction does not appear for 25 minutes, but the duration of retention is only little longer than with intravenous administration—viz., 30 hours. The latter is therefore only indicated in acute cases; for all others the oral method is preferable on account of its ease and safety.

An Intermediate Surgical Hospital at the Front.

New sanitary dispositions have been adopted in the army of General Anthoine which is participating in the Flanders attack. In order that the wounded may be more rapidly picked up and evacuated, three clearing centres have been installed near the fighting line. Competent surgeons attend to control the provisional dressings and supply each patient with a ticket, according to the nature and gravity of his wound, arranging for evacuation to special surgical centres. This arrangement has worked very well in practice. Further, between these clearing centres and the fighting line a new installation has been provided for the transportable wounded in the form of an intermediate surgical hospital, a sort of immense central aid-post with a very thorough organisation and equipment, where all the wounded requiring operation can be attended to before being sent down to the clearing centres and the evacuation hospitals. By this means the dangers of primary infection and of gas gangrene, especially to be feared in an area which is practically a lake of mud, have been reduced to a minimum.

A New Ocular Sign of Death.

Dr. Terson has added a new test to those already known with a view to establishing the certainty of death on the battlefield. All existing tests are insufficient and open to criticism, and this applies to the best of these—viz., the injection of fluorescein as devised by Icard. In certain cases the patient who is still living does not show the green colouration of the conjunctiva with the necessary distinctness. M. Terson recommends the placing on the conjunctiva of a minute quantity of dionin (ethyl-morphine) powder. If death has already occurred it is without effect, but if the patient is still living, although *in extremis*, an immediate and intense local reaction is produced with a purplish-red colouration of the ocular conjunctiva and localised chemosis, which disappears rapidly without leaving a trace or causing inconvenience.

August 27th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

A Dublin General Hospital in France.

THE second contingent of medical men for the Dublin General Hospital has arrived in France, and taken the place of the first contingent, which has been serving there for the last three months. The hospital thus staffed by relays of senior men, who could hardly be spared from their hospitals and classes for a longer period than three months, is a well-equipped unit of 500 beds, and the staff have up to the present been kept busily engaged. Lieutenant-Colonel T. E. Gordon, professor of surgery at Trinity College, Dublin, has

taken over the command from Lieutenant-Colonel E. H. Taylor. The following physicians and surgeons have accompanied him on the staff: Dr. Alex. Blayney, surgeon, Mater Hospital; Dr. Denis Kennedy, surgeon, Vincent's Hospital; Dr. Maurice Hayes, X rayist, Mater Hospital; Dr. R. J. Rowlette, physician, Jervis Street Hospital, and pathologist, Steevens' and Rotunda Hospitals; Dr. G. Pugin Meldon, physician, Baggot Street Hospital; Dr. T. M. Corbet.

Chair of Medicine in the Royal College of Surgeons.

At a special meeting of the Council of the Royal College of Surgeons in Ireland, Lieutenant-Colonel William Taylor, President, in the chair, Major Francis Carmichael Purser, M.D. Dub., F.R.C.P.Irel., was unanimously elected professor of the theory and practice of physic in the Schools of Surgery. Major Purser, who is visiting physician to Mercer's Hospital, received his commission soon after the outbreak of war, and has been working under the Royal Army Medical Corps as consulting neurologist to the Forces in Ireland. He has already occupied the position of examiner in pathology to the Schools of Surgery and that of examiner in medicine to the School of Physic, Trinity College, Dublin.

Irish Nursing Board.

The Irish Nursing Board, established with the approval of the Royal College of Surgeons in Ireland to standardise the education of nurses, to frame a curriculum, to supervise examinations, and to keep a register of the names of nurses who qualify, has drawn up and circulated a scheme for the consideration of the governors of training schools. At present the education of nurses is different for each training school, and the by-laws have been framed in order to enable the Irish Nursing Board to take the place in this country that the College of Nursing in London aims at taking in England. After July 1st, 1920, only the names of those nurses who hold the certificates of the Board, granted after examination, will be entitled to appear on the register. Before admission to the examination the nurse will have to produce evidence of attendance in the wards of a recognised hospital during a period of three years of 45 weeks each, and at a series of lectures delivered in a recognised hospital or by authorised persons. The Board solicits the coöperation of every hospital and institution interested in the welfare of nurses.

August 24th.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

Pilgrims and Disease.

IN his annual report the Sanitary Commissioner with the Government of India calls attention to the part played by large fairs in the spread of disease, special reference being made to the heavy mortality from cholera. 90,508 deaths were attributed to cholera in the United Provinces in 1915, a mortality nearly three times as great as in the previous year, and the pilgrims returning from the fair at Hardwar are regarded as important agents in the spread of infection. In the Punjab cholera was more prevalent than in any year since 1903, causing 13,196 deaths, the same fair being assigned a large part in the spread of the disease. The Bombay Pilgrim Committee, appointed at the suggestion of the Government of India to inquire into the possibility of improving the sanitary arrangements at places in the Bombay Presidency where pilgrims congregate, reports that the chief diseases disseminated by pilgrims are tuberculosis, malaria, small-pox, plague, and the cholera group. The committee unanimously concludes that the effect of pilgrim centres on the health of the general public is very marked, and that the sanitary administration of these centres should guard against the danger and be judged by the measure of success attained in averting its results.

New Concessions to the Medical Services.

Temporary commissions.—The Secretary of State for India has recently sanctioned the following improved terms for medical practitioners possessing qualifications registrable in the United Kingdom who accept temporary commissions in the Indian Medical Service. The candidates are to be permitted to engage either for general service in India or abroad or for service in India (including Burma) but not Aden. In the first case the terms will be: (1) While serving in India, the pay of a permanent lieutenant, Indian Medical Service—namely, Rs. 420 per mensem, or if in officiating charge of a regiment Rs. 450 per mensem; (2) on field service or out of India, £1 4*s.* per diem with free quarters, if available, and rations or compensation in lieu; (3) wound pensions and gratuities and family pensions and gratuities; (4) outfit allowance of Rs. 600 if all spent in India; (5) gratuity of £60 on completion of each term of 12 months or portion thereof, except when services are dispensed with. The terms for the second category of officers will be: (1) Pay Rs. 350, with charger allowances as laid down in Army Regulations, India; (2) free rations or compensation when serving in the field; (3) wound pensions and gratuities and family pensions and gratuities; (4) outfit allowance of Rs. 300.

Passages to India.—The Government of India have decided to grant free passage to and from India to the families of officers of the Royal Army Medical Corps, both special reserve and the holders of temporary commissions, and of officers of the Indian Medical Service engaged in England and now serving in India who renew their contracts.

Infantile Mortality in Calcutta.

The latest available figures show the infantile mortality in Calcutta to be about 280 per 1000 births. The lady superintendent of the Dufferin Hospital has undertaken to endeavour to form an infants' clinic which, if it prove successful, is likely to lead to similar undertakings on a large scale. The whole question of excessive infant, and especially female, mortality in India is one which should engage the energies of the educated classes.

The Amendment of the Bombay Medical Act.

The Bombay Medical Union, of which Mr. K. M. Dubash is president and Mr. R. D. Mody and Mr. A. K. Contractor are joint honorary secretaries, have addressed a letter to the Secretary of Council of Bombay criticising a Bill further amending the Bombay Medical Act which is to be introduced at the next meeting of the Council by the Hon. Mr. V. J. Patel. The Bombay Medical Union object to any additions to the Act which will "permit the association in any way of duly qualified men with quacks and their institutions as contemplated by the Hon. Mr. Patel's Bill." The Union state that subclauses propose to protect the class of men practising as vaids, hakims, &c., the majority of whom are illiterate and uneducated. They have not studied the Ayurvedic, Unani, or other indigenous systems of medicine, such as they are, but are only practising medicine from what little knowledge they may happen to acquire as compounders, assistants to vaids and hakims, or as their menial servants. Generally they study a book of recipes for different ailments and boldly prescribe for any and every disease without making any diagnosis. They may be successful in some of the minor and common ailments which cure themselves or by the use of popular household remedies, but in serious cases or in those requiring knowledge and skill in diagnosis and treatment they do more harm than good. Many of them prescribe European drugs and medicine without having any conception of their composition and under fictitious Indian names. In short, the contention of the Union is that the old systems of medicine have been mostly forgotten and that the old names are now mere tools in the hands of the majority of vaids and hakims. The Union strongly object to the inclusion of the subassistant surgeons and military assistant surgeons in the Bombay Medical Council on the ground that this Council is a judicial as well as a punitive body, and that only men of good education and high professional status should be elected to a body discharging such responsible functions.

A New Medical Faculty in Mysore.

The special committee appointed by the Senate of the Mysore University to draft a scheme for a medical faculty reports ample facilities in Bangalore for creating such a faculty without much expense. The only initial outlay will be the provision of a suitable medical college to accommodate 100 students. The committee suggests a course extending to six years for the degree of M.B. and B.S., with an additional two years for M.D. candidates. The annual expenses for the faculty are estimated at Rs. 23,000 and the cost of the medical college building at Rs. 2½ to Rs. 3 lakhs.

July 14th.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Capt. J. B. Rawlins, R.A.M.C., was a student at St. Mary's Hospital, London, and qualified in August, 1914. He joined up shortly afterwards and was attached to a Highland Field Ambulance.

Major E. F. B. Wilson, South African M.C., qualified at Dublin in 1881, and after practising for a few years in Ireland proceeded to South Africa, where he settled at Harrismith.

Lieut.-Col. F. D. Blandy, R.A.M.C., was a student at the Middlesex Hospital and qualified in 1900. Before joining up in the spring of 1915 he was in practice at Tynemouth, Northumberland, and held several local appointments.

Capt. H. D. Eccles, R.A.M.C., attached Royal Irish Rifles, was a student at Guy's Hospital, London, and qualified in 1893. Before joining up he was in practice at Kawakawa, New Zealand, where he was medical officer to the Bay of Islands Maternity and General Hospital.

Died.

Capt. D. Arthur, M.C., I.M.S., qualified at Glasgow in 1905, and held the appointment of house physician at the Western Infirmary in that city. He was afterwards assistant medical officer of health for Cheadle, and joined the Indian Medical Service in 1909. He died while a prisoner of war at Entelli, Turkey in Asia. The award of the M.C. was recorded in THE LANCET of Oct. 28th, 1916, p. 770.

Brigade-Surgeon Lieut.-Col. H. A. de Lautour, V.D., received his medical education at King's College, London, and qualified in 1874. He was in practice at Wellington, New Zealand, before going on active service, and died at Invercargill.

Capt. H. Y. C. Taylor, R.A.M.C., qualified at Edinburgh in 1896, and before joining up was in practice at Bexhill-on-Sea. He had held appointments at the Throat Hospital, Golden-square, at the Central London Ophthalmic Hospital, and at the Children's Hospital, Great Ormond-street, London; and also at the Huddersfield Infirmary.

Capt. A. Traill, R.A.M.C., qualified L.M.S.S.A. in 1915, and joined up shortly afterwards.

Wounded.

Capt. J. C. Metcalfe, M.C., R.A.M.C.
Capt. H. S. Turner, M.C., R.A.M.C.
Capt. A. J. O'Brien, M.C., West African Field Force.
Major J. P. Kenny, Australian A.M.C.
Capt. J. Kearney, R.A.M.C.
Lieut. T. C. D. Watt, R.A.M.C.
Capt. D. M. Smith, R.A.M.C.
Capt. C. Dundee, R.A.M.C., attached Royal Irish Rifles.
Capt. F. Harris, M.C., R.A.M.C., attached R.F.A.
Lieut. J. H. Mayston, R.A.M.C., attached Border Regiment.
Capt. R. S. Aspinall, R.A.M.C.
Capt. W. B. Loveless, R.A.M.C., attached Royal Irish Rifles.
Capt. S. S. Meighan, R.A.M.C.
Capt. R. W. Kenny, M.C., Canadian A.M.C.
Capt. R. D. MacKenzie, Canadian A.M.C.

Missing.

Capt. A. K. Sinha, I.M.S.
Capt. E. Newton, R.A.M.C.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported :—

Private W. Worthington, Royal West Kent Regiment, killed in action, only son of Dr. H. Worthington, of Luton, Beds.

Second Lieut. G. F. H. Moore, Border Regiment, accidentally killed, only surviving son of the late Col. J. H. Moore, R.A.M.C., of Wellington, Somerset.

Second Lieut. B. W. Penny, Royal Fusiliers, died of wounds, youngest son of Dr. E. J. Penny, of Wolverton, Bucks.

Capt. J. O. W. Shine, Royal Dublin Fusiliers, killed in action, eldest and only surviving son of Col. J. M. F. Shine, A.M.S.

Capt. J. A. Cahill, M.C., Royal Berkshire Regiment, killed in action, only son of Dr. J. Cahill, of Seville-street, London, S.W.

Second Lieut. J. S. Reid, South Wales Borderers, died of wounds, only son of Dr. E. Reid, of Swansea.

Lieut. T. H. Stockwell, Canadian Infantry, killed in action, youngest son of the late Dr. F. Stockwell, of Bruton, Somerset.

Capt. H. O'Connor, M.C., King's Shropshire Light Infantry, died of wounds, eldest son of Mr. C. O'Connor, F.R.C.S.I., of Kildare.

Cadet R. Darling, Royal Irish Rifles, killed in action, youngest son of Dr. J. S. Darling, of Lurgan, Ireland.

Capt. C. Dundee, R.A.M.C., attached Royal Irish Rifles, wounded, youngest son of Dr. C. Dundee, J.P., of Ballycarry, co. Antrim.

Second Lieut. C. W. S. Magill, Royal Irish Fusiliers, wounded, only son of the late Dr. C. Magill, of Lisburn, co. Antrim.

THE HONOURS LIST.

The names of the following members of the medical profession are included in the first list of the recipients of the Most Excellent Order of the British Empire :

Knight Commander of the British Empire.

Edward Stewart, Hon. Lieut.-Col., R.A.M.C.

Commander of the British Empire.

Louisa Garrett Anderson.
Florence Elizabeth, Lady Barrett.
Jay Gould, Lieut.-Col., I.M.S.
Thomas Wheeler Hart.
Flora Murray.
Mary Ann Dacomb Scharlieb.
Mary Chalmers Watson.

Officer of the British Empire.

Wilfred Balgarnie, Temp. Lieut., R.A.M.C.
Duncan McFayden Millar.
William Ernest Nelson.

Member of the British Empire.

Sidney John Oldacres Dickins.
George Cooper Franklin, Lieut.-Col., R.A.M.C. (T.F.)

The following awards to medical officers are announced :—

Distinguished Service Order.

Major Rupert Iggulden Furber, Australian A.M.C.

For conspicuous gallantry and devotion to duty. He had charge of an advanced dressing station for five days, during which it was under heavy shell-fire most of the time. He displayed the greatest ability and devotion to duty in organising the dressing and evacuation of a large number of the wounded, on several occasions helping to bring them in himself.

Lieut.-Col. John Smith Purdy, Australian A.M.C.

For conspicuous gallantry and devotion to duty. Although continually under shell-fire for seven days, he exercised close personal supervision over the evacuation of the wounded, and by his own example of courage and disregard of danger he animated all ranks with a similar attitude of mind. His work during preliminary preparations displayed the same untiring energy and devotion to duty.

Bar to the Military Cross.

Temp. Capt. Ernest Harrison Griffin, M.C., R.A.M.C.

For conspicuous gallantry and devotion to duty. He showed the greatest gallantry in rescuing wounded men by night from "No Man's Land," where they had lain since dawn. He worked for four hours under heavy and continued shell-fire, directing the bearers, encouraging and personally assisting the wounded, thereby enabling a large number of men to get back into our lines. Whilst thus employed he went through the enemy's wire to within 60 yards of his position. His work has been excellent since he came out in 1914.

(The award of the M.C. was recorded in THE LANCET of Sept. 2nd, 1916, p. 450.)

Military Cross.

Capt. Jack Rowland Stanley Grose Beard, Australian A.M.C.

For conspicuous gallantry and devotion to duty on many occasions. He carried out his duties in attending to the wounded under the most trying and difficult circumstances under heavy enfilading artillery fire, afterwards refusing to leave his aid-post, although it was blown in and he was buried. On the following day he went out into a hostile barrage and brought in two stretcher-bearers who had been wounded. At all times his fearless example had the most inspiring effect on his medical staff.

Capt. Wendell Inglis Clark, Australian A.M.C.

For conspicuous gallantry and devotion to duty. He remained on duty for nearly three days with only four hours' rest, attending to over 300 cases of wounded and working mostly under extremely heavy fire. On many previous occasions he has done excellent work whilst under fire, displaying the greatest courage and devotion.

Capt. Laurence Bedford Elwell, Australian A.M.C.

For conspicuous gallantry and devotion to duty. He personally organised, with great ability and entire disregard of his own safety, the evacuation of wounded along a route which was under direct enemy observation and subjected to heavy rifle and machine-gun fire. On another occasion he twice visited an aid-post under intense hostile barrage to assist the officer in charge, displaying, as on all other occasions, the utmost fearlessness and devotion to duty.

Capt. Raphael Leo Kenihan, Australian A.M.C.

For conspicuous gallantry and devotion to duty. He established the most forward regimental aid-post in his division, where he attended to the wounded under heavy shell-fire the whole time. Although himself slightly wounded and compelled to shift his post twice by hostile shell-fire he continued to attend all his cases with the greatest care and devotion, saving many lives by remaining in his forward position and setting a magnificent example.

Temp. Lieut. George Errington Lloyd, R.A.M.C.

For conspicuous gallantry and devotion to duty. He went forward to a captured position on his own initiative, and established an aid-post under shell-fire, amongst shell-holes, where he rendered valuable assistance to the wounded and was always at hand when casualties occurred.

Capt. Keith Shelley Parker, Australian A.M.C.

For conspicuous gallantry and devotion to duty. He went forward under heavy artillery and machine-gun fire, and established his aid-post in a shell-hole, where he worked under most adverse conditions for five days without rest, attending the wounded of many units. He was under shell-fire the whole time, and set a splendid example of devotion to duty.

Temp. Capt. Charles James Lodge Patch, R.A.M.C.

For conspicuous gallantry and devotion to duty in attending to a wounded officer in the front line and removing him to a place of safety. During the whole time he was under shell-fire, by which he was wounded in two places, but disregarded his own wounds until those of the officer had been dressed. His devotion to duty and contempt of danger when under fire have been most marked on many occasions.

Temp. Lieut. Frank Gordon Pedley, R.A.M.C. (Lieut., Canadian A.M.C.).

For conspicuous gallantry and devotion to duty in proceeding to a dug-out, which had been hit by enemy shell-fire, and saving the lives of many of the occupants. He afterwards went through a very heavy barrage to attend to a badly wounded officer, whom he eventually brought back to the dressing station. On both occasions he displayed the utmost gallantry and disregard of danger.

Capt. Harold Powell, Australian A.M.C.

For conspicuous gallantry and devotion to duty in continually working under heavy fire and the most adverse conditions, with complete disregard for his personal safety. As medical officer he is invaluable to his battalion, not only in regard to his assistance in keeping the men medically and physically fit, but by his example of coolness, courage, and good humour when under fire.

Temp. Capt. Laurence Cecil Sebastian Roche, R.A.M.C.

For conspicuous gallantry and devotion to duty when in charge of forward stretcher-bearers. He worked under an intense barrage fire with his bearers, collecting and successfully evacuating large numbers of wounded, through a continuous barrage of 16 hours. His gallant conduct and personal disregard of all danger greatly inspired his men in the execution of their duty.

Temp. Capt. John Ross, R.A.M.C.

For conspicuous gallantry and devotion to duty in remaining in the open from 6 A.M. to 9 P.M., dressing and attending the wounded of his own and other regiments under heavy shell-fire. He then went to assist another unit whose medical officer had been wounded, and during the whole of the operations he set a splendid example of cheerfulness and boundless energy.

Temp. Lieut. John Edward Sandilands, R.A.M.C.

For conspicuous gallantry and devotion to duty in leading his bearers forward under heavy barrage to evacuate wounded. He continued throughout the day to organise and superintend the removal of casualties under heavy shell-fire.

Temp. Capt. John Ingram Shepherd, R.A.M.C.

For conspicuous gallantry and devotion to duty in working unceasingly day and night under heavy shell-fire. The fire was so intense that many of the men he dressed were subsequently killed. His work was marked by the utmost courage and disregard of personal safety under extremely trying conditions.

Capt. Fritz Peter Max Solling, Australian A.M.C.

For conspicuous gallantry and devotion to duty. Although under constant shell-fire for a fortnight, he continued to attend to the casualties of his own and of other units, on one occasion for a period of 24 hours without a break. During a heavy hostile gas attack he displayed the utmost devotion and disregard of danger.

Temp. Capt. Bernard Charles Tennent, R.A.M.C.

For conspicuous gallantry and devotion to duty in continually exposing himself with the utmost fearlessness under heavy shell-fire in order to visit his posts in the front trenches. He dressed many men in the open, regardless of personal danger, and when his bearers became casualties he took their place and assisted to carry the wounded himself.

Capt. Cedric William Whiting, Australian A.M.C.

For conspicuous gallantry and devotion to duty when in charge of stretcher-bearers. He displayed the greatest ability in keeping touch with the aid-post and in clearing the wounded, twice taking his bearers through a heavy barrage for that purpose. His pluck and determination were beyond all praise.

Temp. Capt. Herbert George Willis, R.A.M.C.

For conspicuous gallantry and devotion to duty in leading his men into the front-line trenches to assist regimental stretcher-bearers. He was conspicuous in dressing the wounded under heavy fire, taking out a party and exposing himself with the utmost fearlessness, thereby ensuring all the wounded being removed to the aid-posts.

Capt. Roy Coupland Winn, Australian A.M.C.

For conspicuous gallantry and devotion to duty when in charge of stretcher-bearers. He constantly patrolled the bearer line under very heavy shell-fire, maintaining communication between aid-posts and dressing stations, and on one occasion he took a squad across the open through an intense barrage to an aid-post in order to relieve a temporary glut of wounded. He was twice wounded, the second time severely, and his gallant conduct was the means of saving many lives.

Capt. John Smythe Yule, Australian A.M.C.

For conspicuous gallantry and devotion to duty whilst under heavy shell-fire. Although gassed early in the operation he remained continuously on duty for two days, during which time 450 cases passed through his hands. He has shown great gallantry on numerous previous occasions.

The following awards to and promotions of medical officers are particular to the operations in Mesopotamia:—

C.M.G.—Lt.-Col. and Bt.-Col. M. H. G. Fell, R.A.M.C.; Lt.-Col. and Bt.-Col. J. M. Sloan, D.S.O., R.A.M.C.; Lt.-Col. (temp. Col.) C. N. C. Wimberley, I.M.S.; Lt.-Col. E. V. Hugo, I.M.S.; Lt.-Col. (temp. Col.) W. H. Ogilvie, I.M.S.; Temp. Lt.-Col. T. P. Legg, R.A.M.C.

C.I.E.—Maj. D. Munro, I.M.S.; Lt.-Col. F. O. N. Mell, I.M.S.; Lt.-Col. B. Nauth, I.M.S.

To be Brevet Lieutenant-Colonel.—Maj. L. J. M. Deas, I.M.S.; Maj. J. D. Graham, I.M.S.; Maj. A. W. M. Harvey, I.M.S.; Maj. H. M. H. Meihuish, I.M.S.; Maj. D. S. Skelton, D.S.O., R.A.M.C.; Maj. T. S. B. Williams, I.M.S.

To be Brevet Major.—Capt. L. Dunbar, R.A.M.C.; Capt. L. H. L. Mackenzie, I.M.S.; Capt. W. McNaughton, R.A.M.C.

Distinguished Service Order.—Lt.-Col. J. H. R. Bond, R.A.M.C.; Maj. and Bt. Lt.-Col. G. Browse, I.M.S.; Capt. (actg. Lt.-Col.) E. T. Burke, R.A.M.C., Spec. Res.; Maj. (temp. Lt.-Col.) A. B. Fry, I.M.S.; Maj. S. R. Godkin, I.M.S.; Capt. G. R. Lynn, I.M.S.; Capt. J. S. McCombe, R.A.M.C.; Capt. W. K. Morrison, R.A.M.C.; Lt.-Col. (acting Col.) H. M. Morton, R.A.M.C.; Maj. T. G. F. Paterson, I.M.S.; Lt.-Col. E. L. Perry, I.M.S.; Capt. D. C. Pim, R.A.M.C., Spec. Res.; Lt.-Col. W. A. Woodside, R.A.M.C.

Bar to Military Cross.—Capt. C. A. Wood, M.C., I.M.S.

Military Cross.—Capt. F. J. Anderson, I.M.S.; Capt. L. D. Bailey, R.A.M.C.; Capt. C. H. N. Baker, I.M.S.; Capt. W. Bisset, R.A.M.C.; Temp. Capt. A. Budd, R.A.M.C.; Capt. H. Chand, I.M.S.; Temp. Capt. A. J. Ireland, R.A.M.C.; Capt. J. Melvin, R.A.M.C., Spec. Res.; Capt. S. H. Middleton-West, I.M.S.; Capt. C. H. Reinhold, I.M.S.; Capt. E. P. A. Smith, R.A.M.C.; Capt. N. S. Sodhi, I.M.S.; Temp. Capt. D. McD. Wilson, R.A.M.C.

THE CENTRAL MEDICAL WAR COMMITTEE.

At a meeting of the Committee held on August 29th the following resolution was passed:—

This meeting of the Central Medical War Committee represents to the Government that, in view of the composition of the Committee of Inquiry (the only intimation of which it has received through the public press), it is emphatically of opinion that unless at least the chairman of the Central Medical War Committee is added thereto the personnel of the new committee will not satisfy the opinion of the general body of medical practitioners in this country.

The resolution has been communicated to the Secretary of State for War.

THE IVORY CROSS AND "DEARER DENTISTRY."

It has been brought to the notice of the Council of the Ivory Cross that certain papers have announced in paragraphs, obviously inspired by untrained dental practitioners, that the fees paid by this organisation have been raised. Captain the Right Hon. Lord Greville, as chairman, states in reply that the fees accepted by the qualified dentists are exactly the same as paid by the Soldiers' and Sailors' Dental Aid Fund, founded in 1914, of which the Ivory Cross is the outcome—this in spite of the increased cost of establishment charges and of all dental materials. An additional strain is thereby thrown upon the patriotism of a professional class hard hit in many directions by the war. All officials are volunteers giving their services, and the generous help of many specialists is at the disposal of the Fund; its good work grows daily in volume and is only limited by the amount of moneys subscribed by a generous public. Donations in aid of its national work of mercy may be sent to the honorary treasurer, Sir Herbert Bartlett, Bart., 10, Conduit-street, W. 1.

TREATMENT OF DISABLED SOLDIERS IN SCOTLAND.

Mr. Duncan Millar asked the Minister of Pensions in the House of Commons recently to state the number of schemes which had been approved in Scotland for the treatment of disabled soldiers, and the arrangements which had been completed by the local committee set up in Scotland to deal with this subject. Mr. Barnes replied that no general schemes for the institutional treatment of disabled soldiers have yet been submitted by local committees in Scotland on the lines set out in the recent instructions issued by the Ministry of Pensions, but that the Statutory Committee have approved of the use of 240 institutions in Scotland, and local committees are able to send cases direct to these institutions in accordance with the terms of approval. The Joint Institutional Committee for Scotland, which has lately been constituted, is now making arrangements for the purposes of a neurasthenic home near Edinburgh and for a number of orthopædic annexes. The treatment of discharged sailors and soldiers suffering from rheumatism is undertaken at Moffat and Strathpeffer, and the provision of increased accommodation for paraplegics and for men suffering from epilepsy and tuberculosis is under consideration.

OBITUARY OF THE WAR.

GEORGE STEPHEN PIRIE, M.B., CH.B. EDIN.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain G. S. Pirie, who was killed in action in France on July 24th, on his twenty-ninth birthday, was the second son of the late George Pirie, of Leopards Vlei and Wonder Heuvel, Cape Colony, and of Banff, Scotland. He was educated at St. Andrew's College, Grahamstown, South Africa, entering the University of Edinburgh in 1909, graduating M.B., Ch.B. with distinction in July, 1914. He then held the post of senior house physician at the Leith Hospital, resigning this appointment to take a commission in the Royal Army Medical Corps. He was sent out to Gallipoli, where he saw much service with the Royal Fusiliers. He was wounded and returned to England to recover. Later he went to France as medical officer to the East Surrey Regiment, with which he remained until his death, being mentioned several times in despatches. While tending the wounded in the trenches he was instantly killed by a shell.

Captain Pirie was popular with his fellow students and teachers at Edinburgh University, where he belonged to the medical unit of the O.T.C. His superior officers write of him as an able medical officer who gave of his best to those under his care without thought of himself.

FRANK WHINCUP, F.R.C.S. EDIN.,

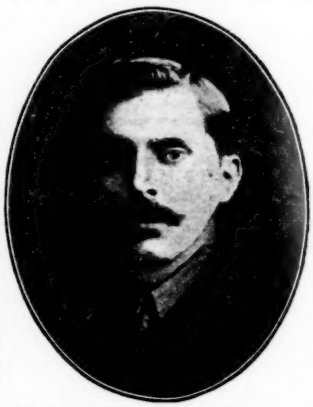
LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant F. Whincup, who was accidentally drowned whilst bathing at Havre on July 2nd, at the age of 42 years, was the third and youngest son of the late Charles Todd Whincup, of Green Hammerton, Yorks. He was educated at Leeds Grammar School and St. Bartholomew's Hospital, taking the diplomas of the Conjoint Board in 1897. After holding resident appointments at the Royal Salop Infirmary, Shrewsbury, the Devon and Cornwall Hospital, Plymouth, and the Stroud General Hospital, he returned to Shrewsbury in 1900 to enter into general practice with Mr. Harold H. B. MacLeod, and did much work at the Eye, Ear, and Throat Hospital as assistant and anæsthetist, under Mr. C. G. Russ Wood. Three years ago he was elected physician to the Royal Salop Infirmary. One of his colleagues there writes of him: "It is, perhaps, at the infirmary, more than anywhere, that his loss to the profession will be most seriously felt. He possessed a marvellously retentive memory, and never apparently forgot anything he had read or any case he had seen; and this faculty, coupled with his own keen observation and ripe judgment, rendered his opinion one of great value to his colleagues, medical and surgical alike. Although in his forty-third year, and engaged in a large practice, he felt it his duty to offer himself to the R.A.M.C., and in order to fit himself for military service he underwent an operation for radical cure of hernia and removal of an appendix which had caused him trouble. It was his bright, cheery personality, his keen sense of humour, and his ever-ready willingness to help either his patients or his professional brethren that endeared him to so many in and around Shrewsbury, where his loss is mourned by rich and poor alike."

JAMES HENRY HORTON, M.R.C.S. ENG.,

DISTINGUISHED SERVICE ORDER;
BREVET LIEUTENANT-COLONEL, INDIAN MEDICAL SERVICE.

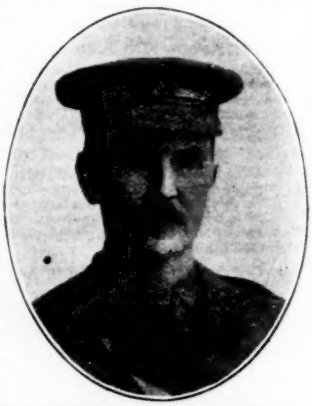
Lieutenant-Colonel James Henry Horton, who died of heat-stroke in Mesopotamia on July 23rd, at the age of 46 years, was eldest son of Major James Horton, retired, 4th Dragoon Guards. He was educated at Guy's Hospital, where he won the Arthur Durham Prize, and after qualifying in 1895 held a house appointment at his own hospital and afterwards at the Priory, Roehampton, and the Bethlehem Hospital. From 1899–1901 he was plague medical officer at Bombay, and in 1902 entered the Indian Medical Service, winning the Marshall Webb Prize while at the military school, Netley. In Somaliland (1903–04) he took part in the actions of Daratolah and Iidhalli, receiving mention in despatches and being awarded the D.S.O. In 1908 he was with the Mohmand Field Force, getting the medal and clasp. In the Balkan War (1912–13) he acted as a surgeon of the British Red Cross Society, again obtaining a medal and clasp. At the outbreak of hostilities he was personal assistant to the surgeon-general with the Government of Bombay, and was sent to Mesopotamia as Deputy Assistant Director of Medical Services, being present at the relief of Kut and the capture of Bagdad. He was twice mentioned in despatches. Colonel Horton also held the Order of St. George and St. Vladimir of Russia.



FREDERICK CECIL HOLMAN PIGGOTT, M.D. CAMB.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain F. C. H. Piggott, who died very suddenly at the Military Hospital, Sutton, on June 24th, at the age of 57 years, was educated at Merchant Taylors' School and Emmanuel College, Cambridge, where he was a scholar and prizeman, continuing his medical studies at St. Thomas's Hospital. After taking the diploma of M.R.C.S. Eng. in 1884 he was sent out by the National Aid Society as surgeon in the Sudan campaign of 1885, obtaining the medal and clasp "Suakim" and Khedive's bronze star, and acting as H.B.M.'s Consul for East Sudan. In the following year he took his medical degree at Cambridge, afterwards settling in practice at Teignmouth, where he became honorary consulting physician to the hospital and medical officer of health to the urban district and port sanitary authority. During the first year of the war he gave up his extensive practice to take a commission in the Royal Army Medical Corps, being appointed specialist sanitary officer of the Wylye Valley district. His death makes a blank in a wide circle of friends. Captain Piggott leaves a widow and a son and daughter.



THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

C. S. Woodwright to be Deputy Surgeon-General.

Surgeon W. H. Cheyne, who relinquished his appointment on account of ill-health contracted in the Service, to retain his rank.

Fleet-Surgeon R. Miller is placed on the Retired List, at own request, with rank of Deputy Surgeon-General.

To be temporary Surgeons: R. Silcock, G. W. Pratt, and K. R. Hill.

The following appointments have been notified:—Fleet-Surgeons: R. W. Townley and E. A. Snaw to *Pembroke*; M. P. Jones, J. D. Milligan, and A. W. Walker, all to *Vivid*. Staff-Surgeons: W. N. Blatchford to *Vivid*; J. H. Wright to Chatham Dockyard. Surgeon S. L. McBean to *Victory*. Temporary Surgeons: A. W. Gunn and D. S. MacKnight to *Pembroke*; C. H. Gould to *Research*, for Portland Hospital; F. A. Knott to *Achilles*; W. P. Jones to *Harrier*; M. Fawkes to *Europa*: A. McMillan to *Pembroke*; W. Duncan to *Emperor of India*.

ROYAL NAVAL VOLUNTEER RESERVE.

The following appointment has been notified:—Surgeon Probationer: G. Burnett to *Legion*.

ARMY MEDICAL SERVICE.

Col. F. W. C. Jones, C.B., is retained on the Active List under the provisions of Arts. 120 and 522, Royal Warrant for Pay and Promotion, and to be supernumerary.

Lieutenant-Colonels to be temporary Colonels whilst employed as Assistant Directors of Medical Services: G. W. Tate, F. E. Gunter.

Capt. W. C. Smales, D.S.O., R.A.M.C., to be Deputy Assistant Director-General.

Temp. Major F. B. Carron, Canadian A.M.C., relinquishes his appointment as Deputy Assistant Director of Medical Services.

Temp. Capt. H. C. Mersereau, Canadian A.M.C., relinquishes his appointment as Deputy Assistant Director of Medical Services.

TERRITORIAL FORCE.

Col. J. B. Mann relinquishes his commission on account of ill-health, and is granted permission to retain his rank and wear the prescribed uniform.

Lieut.-Col. R. Pickard, C.M.G., to be Assistant Director of Medical Services, and to be temporary Colonel whilst so employed.

Capt. H. M. Calder, D.S.O., M.B., to be Deputy Assistant Director of Medical Services.

ROYAL ARMY MEDICAL CORPS.

The undermentioned officers are granted temporary rank as stated:—As Lieutenant-Colonels: Lieut.-Col. H. Maturin, Hamps. R.; Lieut.-Col. J. F. Haswell, Bord. R.; Temp. Lieut.-Col. F. R. Hill, R.F.A. As Majors: Major F. R. S. Cosens, Devon. R.; Major T. B. Heggs, E. Kent R.

Lieut.-Col. G. J. A. Ormsby, D.S.O., to be temporary Colonel whilst an Assistant Director of Medical Services of a Division.

Temp. Lieut.-Col. R. P. Jack (T.F.) to be temporary Lieut.-Colonel.

Major (temp. Lieut.-Col.) E. McDonnell, D.S.O., to be an Assistant Director of Medical Services of a Division and to retain his temporary rank whilst so employed.

Major W. J. Waters to retain the acting rank of Lieutenant-Colonel whilst in command of a Stationary Hospital.

To be acting Lieutenant-Colonels whilst in command of a General Hospital: Major T. E. Fielding, D.S.O., Temp. Major H. H. Serpell.

To be acting Lieutenant-Colonels whilst in command of a Casualty Clearing Station: Major Walter J. Waters, Major E. W. Siberry, and Major J. M. H. Conway, D.S.O.; Capt. H. G. Monteith, D.S.O., whilst in command of a Field Ambulance.

The undermentioned Majors to be acting Lieutenant-Colonels whilst in command of a Stationary Hospital; R. B. Hole, (Bt. Lieut.-Col.) Charles R. Sylvester Bradley.

Temporary Majors to be temporary Lieutenant-Colonels: C. S. McVicar and W. J. O. Malloch.

Capt. R. E. U. Newman, M.C., to be acting Lieutenant-Colonel whilst in command of a Field Ambulance.

Temp. Capts. A. W. Robertson and S. G. Chown to be temp. Majors.

Temp. Capts. D. A. L. Graham, W. H. Lowry, and R. G. Armour to be acting Majors while temporarily employed.

To be Acting Majors: Capt. H. A. Hammick, Manch. R., T.F., whilst holding a special appointment, Surg.-Gen. T. P. Woodhouse, C.B., Col. R. J. Windle, and Temp. Capt. H. E. Cumming, Canadian A.M.C.

Temp. Lieuts. E. S. Jeffrey, C. G. McAdam, H. Harrison, G. H. U. Corbett, A. B. Moffat, H. O'Neill, H. R. Bayley, and E. K. Campbell to be temporary Captains.

To be temporary Honorary Lieutenants: C. E. Allison, M. C. Pruitt, R. G. Carothers, J. F. Harvey, L. K. Valade, and F. A. Simonds.

H. F. Bold-Williams to be temporary Honorary Lieutenant whilst doing duty with No. 8 Red Cross (Baltic and Corn Exchange) Hospital.

Officers relinquishing their commissions: Temp. Capts. G. S. Miller (granted the honorary rank of Captain), J. H. Patterson, R. V. McDonnell, M.C., F. J. Livingston, and V. F. Stock and D. Villeneid (on account of ill-health), and Temp. Lieuts. R. D. Ferguson and J. Young.

Lieut.-Col. (temp. Col.) P. Evans, C.M.G., relinquishes his temporary rank on re-posting.

The undermentioned relinquish the acting rank of Lieutenant-Colonel on re-posting: Major W. C. Croly, Capt. J. L. Wood.

SPECIAL RESERVE OF OFFICERS.

Major J. Clerke to be acting Lieutenant-Colonel whilst in command of a Stationary Hospital.

Capt. (temp. Major) E. M. Jenkins relinquishes his temporary rank on ceasing to command a Field Ambulance.

Lieutenants to be Captains: D. Stewart, L. P. Johns.

Capt. A. T. Pitts, from R.A.M.C., T.F., to be Captain.

To be Lieutenants: T. W. Shaw, J. W. Bowman and C. A. Harvey (from Aberdeen University Contingent O.T.C.), J. Irvine and J. Kinnear (from St. Andrews University Contingent O.T.C.), D. J. Valentine, C. M. Titterton, S. W. Page, and B. H. Glenny (from the University of London Contingent O.T.C.), F. J. Charlton (from St. Andrews University Contingent O.T.C.), H. B. Dykes (from Edinburgh University Contingent O.T.C.), G. K. Fulton, W. Adams, R. Aitken, T. Fleming, J. S. Martin, N. MacKillop, W. Dempster, E. P. Irving, J. H. Shearer, W. McWilliam, J. Ashforth, and J. S. Craig (from Glasgow University Contingent O.T.C.), H. E. Charles, C. H. Smith, P. Shillito, N. Pick, G. F. Hurst, H. V. Horsfall, J. H. Parker, S. Adler, P. V. Anderson, and H. J. Rice (from Leeds University Contingent O.T.C.), Second Lieut. G. F. Mitchell (from Unattached List, T.F.).

Capt. A. G. W. Compton, M.C., relinquishes his commission on account of ill-health.

TERRITORIAL FORCE.

Lieut.-Col. H. W. Webber is seconded for duty with a General Hospital.

Major P. G. Williamson, M.C., to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. (acting Lieut.-Col.) R. W. Brimacombe to be Major and acting Lieutenant-Colonel.

Capt. S. G. Webb and Capt. J. Gilchrist are restored to the establishment.

Capt. J. G. Emanuel is seconded for duty with a General Hospital.

Capt. J. W. Mackenzie to be Major.

Lieuts. N. J. Allan and W. Brander to be Captains.

Capt. H. M. Calder, D.S.O., M.B., is seconded whilst holding an appointment as Deputy Assistant Director of Medical Services.

Lieut.-Col. R. Pickard, C.M.G., is seconded whilst holding an appointment as Assistant Director of Medical Services.

Capt. F. J. Stansfield is restored to the establishment.

Capt. R. Michell is restored to the establishment.

Capt. A. R. Short is seconded for duty with a Casualty Clearing Station.

Major C. J. Martin, from Army Medical Service, to be Major.

Majors W. D. Watson and W. A. Burns to be acting Lieutenant-Colonels whilst commanding Field Ambulances.

Major (acting Lieut.-Col.) W. A. Burns, Capt. (acting Lieut.-Col.) J. Blackwood, and Capt. (temp. Major) D. E. Evans relinquish their acting rank on ceasing to command Field Ambulances.

VOLUNTEER FORCE.

Northamptonshire Medical Volunteer Corps: E. H. Harries-Jones to be temporary Major and A. W. Cooke to be temporary Captain.

OVERSEA CONTINGENTS.

Canadian Army Medical Corps.

Temp. Major F. C. Bell to be acting Lieutenant-Colonel while specially employed.

Temp. Capt (acting Major) A. Croll to be acting Lieutenant-Colonel while specially employed.

Temporary Captains to be temporary Majors: G. Musson, E. C. H. Windeler, A. MacPhail, F. S. Burke.

Temp. Capt. W. Ross to be acting Major while specially employed.

Temp. Capt. W. J. Enright to be acting Major.

Temp. Capt. (acting Major) P. Poisson, M.C., to be temporary Major.

Temp. Capt. G. M. Davis to be acting Major while specially employed.

Temporary Lieutenants to be temporary Captains: R. H. Angrove, N. H. Little, J. R. Rehill, T. D. Bennett.

To be temporary Captains: H. D. L. Spence, W. B. Honey.

Temporary honorary Lieutenants to be temporary honorary Captains, without pay and allowances: F. F. Tisdall, E. K. Clarke.

South Africa.

T. L. Blackburn to be temp. Captain, South African Medical Corps.

INDIAN MEDICAL SERVICE.

Bt. Lieut.-Col. F. Wall to be Assistant Director of Medical Services.

Capt. W. E. R. Williams to be Deputy Assistant Director of Medical Services.

The King has approved the retirement of Lieut.-Col. A. W. Dawson (in consequence of ill-health due to field service) and Lieut.-Col. E. C. Hare (in consequence of ill-health).

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

In the July issue of this journal, which begins a new volume, Captain David Thompson concludes his long article on the Diagnosis and Treatment of Malarial Fever. With regard to the treatment he says: "In all cases, whether acute, chronic, or latent, and in cases of gamete carriers, commence a thoroughly routine treatment as early as possible with the idea of obtaining a permanent cure from the beginning. The treatment may be considered severe, but it pays, and it means that less quinine will be needed in the long run." Ten to 15 grains of quinine in solution are given by the mouth three times daily for three weeks, hypodermic injections in some cases, and small doses of liquor arsenicalis. Temporary Colonel Andrew Fullerton, consulting surgeon to the British Expeditionary Forces, describes the use of the opaque ureteral catheter to localise missiles in the region of the kidney and ureter, and Major A. R. Ferguson contributes some notes on bilharziasis, in which he says the essential facts with regard to its mode of infection are now so well known that the necessary measures for its avoidance may be made precise, and should be stringently enforced, in the hope that military efficiency may not be impaired in the immediate future, and that the country may be saved the payment of large sums in compensation to men who need not have been infected. Captain W. J. Tulloch has a paper on the differentiation by means of the absorption of agglutinin test of the types of meningococci obtained from the cerebrospinal fluid. Major F. W. Mott's paper on Punctiform Hæmorrhages of the Brain in Gas Poisoning, read before the Royal Society of Medicine, is reprinted, and there are some interesting notes on the venereal division of the general hospital, Alexandria, by Captain W. C. Jardine. "Possibly," says the author, "as a result of the lectures on venereal disease which have been given to troops in Egypt, and of the stories told by the venereal patients on discharge from hospital, we find that the soldiers report sick very early, in fact usually as soon as the sore appears. On this account we rely a great deal on our bacteriologist for an early diagnosis of syphilis. Cases with well-marked secondaries are diagnosed clinically and put under treatment at once. ..... The average period in hospital for patients has been: Syphilis, 39 days; gonorrhœa, 34 days; soft chancre, 30 days."

Correspondence.

"Audi alteram partem."

ARGUMENT AND AGREEMENT.

To the Editor of THE LANCET.

SIR,—The plain man finds it somewhat disconcerting to note how often nowadays eminent medical controversialists are complaining that their arguments are misunderstood by their opponents, or that they themselves fail completely to comprehend those of the other side. Phrases such as "I frankly confess I don't understand him," and "It is quite apparent that he does not understand me" are of distressingly frequent occurrence. Yet it is quite obvious that in the case of two such men as Sir Clifford Allbutt and Sir James Mackenzie neither can possibly be as "slow in the uptak'" as is implied. The matter is really, I think, a code difficulty. Each talks in a language foreign to the other, and translation is imperfect. Some interesting considerations seem thereby to present themselves.

As we come more closely to grips with the nature of things, we leave farther and farther behind us those elemental crudities of thought which can be fairly accurately expressed and conveyed to another mind by the agency of the written or spoken word. When the thoughts and ideas we have to transmit become more and more subtle, we become increasingly conscious of the unsatisfactory nature of the medium of intercourse and the thought leakage which occurs owing, as it were, to the high resistance encountered in transmission. Is it necessary to conclude, then, that the ideas now to be conveyed are so subtle and tenuous that we may be faced ultimately with a bankruptcy of language, and that thought may so far outstrip its codes of expression that progress may be seriously hampered thereby? There are, at any rate, some remedies we can apply before things come to such a pass.

It is due to an imperfect appreciation of these considerations that we find such a mass of merely verbal criticism in present-day scientific communications—so much argument and so little agreement. In order that progress may be made economically without unnecessary waste of time and effort, it is just as important to ascertain where we are in agreement with others as where we differ from them. The possibility that another man may be using a different code from the one to which we are accustomed, or may indeed have originated, is not always suspected. The recent controversy between Professor Bayliss and Mr. MacDonagh is an excellent case in point. Many misunderstandings would be avoided did a debater endeavour faithfully to translate the code of the other man before coming to the conclusion that the opponent is writing nonsense. If we see a paper in a foreign language with which we are imperfectly acquainted we do not condemn its statements until we are satisfied that we have made an accurate translation. It is perhaps natural, however, to be a little intolerant, and to wish to impress our own particular code upon all men.

I do not wish it to be thought that I hold any brief for inaccuracy or obscurity in expression, but we have to remember that, unfortunately, Raphael Hythlodaye did not preserve for us the Utopian alphabet. The best remedy, failing a perfect code, is to make as sure as we can that the ideas conveyed to our minds are identical with those originating in the mind of a writer, not forgetting that, as Thoreau said of truth, it takes two to express a thought. If we were more careful over our translations we should find doubtless that many truths, hotly debated, were in reality denied by none, and new truths would have a better chance of acceptance, because they would stand out more clean-cut and clear.

I am, Sir, yours faithfully,

August 28th, 1917. E. W. ADAMS.

THE STUDY OF FUNCTION IN DISEASE.

To the Editor of THE LANCET.

SIR,—In a leading article in THE LANCET of May 26th, p. 805, the importance of considering the functional capacity of organs, even when diseased, is insisted on, and although it is often extremely important to understand the exact pathological condition of any organ, we should, I think, remember that from the patient's standpoint, except in so far as such knowledge can favourably influence treatment, the actual condition of an organ may be immaterial; the important feature, from his point of view, is how far he can go on with his work and what his ultimate prospects in life are going to be. Thus, in a disease so common as tuberculosis many individuals have lesions which may or may not be demonstrated physically, or by the X rays, which nevertheless give rise to no symptom of ill-health, and may never cause any trouble even in the course of a long life. We are therefore thrown back on some other method of discovering the necessity or otherwise for treatment, and we shall find that our only resource consists in a consideration of the patient's symptoms together with accurate estimations of the temperature. Too often, time which is most valuable at a given stage of disease is put off, whilst we wait for some event which will clinch the diagnosis, time which should have been used in bringing about the cessation of the symptoms, and which in many instances would have prevented the occurrence of such evidence as the finding of tubercle bacilli in sputum.

In this connexion I do not think that my old and honoured preceptor Sir Thomas Clifford Allbutt is quite so hidebound in tradition as Sir James Mackenzie would imply. In 1904 he allowed me to take my M.D. degree at Cambridge for a thesis on the diagnosis of pulmonary tuberculosis which was largely a plea for the recognition of pulmonary tuberculosis not from physical signs but from symptoms. In the final paragraph but one of this thesis, which has not been published, occurs the following sentence:

"In the consideration of diagnosis physical signs have been ignored, not in any spirit of disparagement nor yet because less able to appreciate them than some others, but rather in the belief that it is from symptoms and not from these that we shall gain most information at a time when diagnosis is still useful."

Sir James Mackenzie in THE LANCET of August 18th urges the importance of considering "the patient's sensations" as the most important factor as a warning of the onset of serious and, perhaps, if not treated correctly, of fatal disease; although he is chiefly concerned in his letter with heart disease, a matter with which I do not feel competent to deal, yet his observations certainly apply with great force to the diagnosis of pulmonary tuberculosis. For some years now I have endeavoured to insist that the most important matter in the diagnosis of pulmonary tuberculosis is the examination of symptoms which, of course, largely deals with the patient's sensations. Until this matter is taken up by the profession, it is quite useless propounding schemes for the eradication and successful treatment of this malady. Fortunately in tuberculosis it is much easier than in diseases of the heart to analyse a patient's sensations. It is eminently true of tuberculosis that "long before physical signs are evident the patient is conscious there is something amiss," also that "disease when it is so far advanced as to produce a physical sign, which means usually damage to the tissues, and is therefore beyond the stage of cure, is admitted to the hospital wards" (*sc.* sanatorium).

Many even now regard the finding of tubercle bacilli as a correct means of diagnosing pulmonary tuberculosis, for the purpose of deciding whether a patient should undergo sanatorium treatment. If I might be allowed to give an opinion, such a discovery more often means that the patient has passed beyond the early stage, and therefore is not a suitable case for treatment in a sanatorium; even in chronic cases, which often go on for years, it will often be found difficult to find the tubercle bacillus, and when these do appear abundantly and are found easily, as a rule the course of the disease is not long protracted.

I am, Sir, yours faithfully,

EDWARD E. PREST.

Ayrshire Sanatorium, New Cumnock, August 28th, 1917.

RAT-BORNE FEVER.

To the Editor of THE LANCET.

SIR,—I was very pleased with the suggestion contained in the annotation on rat-borne fever appearing in THE LANCET of August 11th that there may be a causal connexion between rats and trench fever. So long ago as the spring of 1915 I had this idea in mind when gathering material for a clinical note which you published in THE LANCET of Sept. 25th, 1915, under the title "Relapsing Febrile Illness

of Unknown Origin." I had read accounts of rat-bite fever in several text-books, and its close resemblance to the illness I noted and described struck me forcibly. I mentioned my suspicions to several bacteriologists from time to time, but so far none have produced evidence to confirm them. Subsequent clinical observations show that trench fever (as the illness I described is now called) does in the acute paroxysmal stage often drag on for weeks, and though, on the other hand, there are some who recover rapidly, there are others who remain debilitated for long after the acuter phases have passed.—I am, Sir, yours faithfully,

August 26th, 1917. J. H. P. GRAHAM.

URBAN VITAL STATISTICS.

VITAL STATISTICS OF LONDON DURING JULY, 1917.

In the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the ten diseases specified in the table was equal to an annual rate of 3·5 per 1000 of the population, estimated at 4,237,287 persons; in the three preceding months the rates were 3·7, 3·5, and 3·4 per 1000 respectively. The lowest rates for the month were recorded in Paddington, Chelsea, the City of Westminster, Finsbury, and the City of London; and the highest rates in Bethnal Green, Southwark, Bermondsey, Wandsworth, Camberwell, and Greenwich. Scarlet fever was rather more prevalent than it had been in other recent months; the greatest proportional prevalence of this disease was recorded in Bethnal Green, Poplar, Bermondsey, Wandsworth, Camberwell, and Greenwich. The Metropolitan Asylums Hospitals contained 644 scarlet fever patients at the end of the month, against 712, 613, and 595 at the end of the three preceding months; the weekly admissions averaged 101, against 93, 92, and 83 in the three preceding months. The prevalence of diphtheria was also slightly in excess of that recorded in the two preceding months; this disease was proportionally most prevalent in St. Pancras, Holborn, Stepney, Southwark, Bermondsey, Deptford, and Greenwich. The number of diphtheria patients remaining under treatment in the Metropolitan Asylums Hospitals at the end of the month was 1070, against 1048 and 1042 at the end of the two preceding months; the weekly admissions averaged 142, against 129 and 138 in the two preceding months. Enteric fever was more prevalent than it had been in any of the earlier months of the year; of the 44 cases notified during July, 8 belonged to Hammersmith, 6 to Wandsworth, 4 to Kensington, 4 to Stepney, 4 to Lambeth, 3 to Poplar, and 3 to Camberwell. There were 41 enteric fever patients under treatment in the Metropolitan Asylums Hospitals at the end of July, against 25, 27, and 31 at the end of the three preceding months; the weekly admissions averaged 7, against 6 in each of the two preceding months. Erysipelas was proportionally most prevalent in St. Marylebone, St. Pancras, Shoreditch, Deptford, and Greenwich. Of the 9 cases of puerperal fever notified during the month, 2 belonged to Chelsea. The 15 cases of cerebro-spinal meningitis included 2 in Hackney and 2 in Camberwell; and the 2 cases of poliomyelitis belonged respectively to Stepney and Wandsworth.

The mortality statistics in the table relate to the deaths of persons actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the four weeks ending July 28th the deaths of 3535 London residents were registered, equal to an annual rate of 10·9 per 1000; in the three preceding months the rates had been 13·2, 13·9, and 12·0 per 1000 respectively. The death-rates for the month ranged from 5·2 in the City of London, 8·4 in Lewisham, 8·5 in Fulham 8·8 in Wandsworth, and 8·9 in Woolwich, to 12·3 in Finsbury, 12·6 in Stoke Newington, 12·7 in Bermondsey, 13·2 in Shoreditch, 13·7 in Holborn, 13·8 in Deptford, and 15·3 in Southwark. The 3535 deaths from all causes included 249 which were referred to the principal infectious diseases; of these, 89 resulted from measles, 6 from scarlet fever, 37 from diphtheria, 34 from whooping-cough, 11 from enteric fever, and 72 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded during the month in St. Marylebone, Holborn, or the City of London; among the other boroughs they caused the lowest death-rates in the City of Westminster, Wandsworth, Lewisham, and Woolwich; and the highest rates in Finsbury, Poplar, Southwark, and Deptford. The 89 deaths from measles were somewhat below the corrected average number in the corresponding period of the five preceding years; this disease was proportionally most fatal in Paddington, Kensington, Hammersmith, Islington, Finsbury, and Deptford. The 6 fatal cases of scarlet fever were only one-third of the corrected average number, and belonged respectively to Paddington, Kensington, Hackney, Shoreditch, Lambeth, and Wandsworth. The 37 deaths from diphtheria were equal to the corrected average number, and included 5 belonging to Poplar, 5 to Southwark, 4 to St. Pancras, and 4 to Lambeth. The 34 fatal cases of whooping-cough were 24 below the corrected average, and included 4 in Poplar, 4 in Camberwell, and 3 each in Fulham, Islington, Hackney, Stepney, and Battersea. The 11 deaths from enteric fever were slightly below the corrected average number, and included 2 each in Southwark, Bermondsey, and Lambeth. The 72 fatal cases of diarrhœa and enteritis among children under 2 years of age were 28 below the corrected average; the greatest proportional mortality from this cause was recorded in Kensington, Fulham, Chelsea, and Southwark. In conclusion, it may be stated that the aggregate mortality in London during the month from these principal infectious diseases was nearly 23 per cent. below the average.

(Week ended August 18th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 10·5 per 1000, against 11·2, 10·3, and 10·4 per 1000 in the three preceding weeks. In London, with a popu-

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING JULY, 1917.

(*Specially compiled for* THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1916.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.									
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.	Deaths from all causes.	Death-rate per 1000 living.
LONDON	**4,237,387**	—	**399**	**560**	—	**44**	—	**9**	**117**	**15**	**2**	**1146**	**3·5**	—	**89**	**6**	**37**	**34**	**11**	**72**	**249**	**0·8**	**3535**	**10·9**
West Districts:																								
Paddington	130,668	—	5	9	—	—	—	—	—	1	—	15	1·5	—	6	1	—	—	—	1	8	0·8	94	9·4
Kensington	152,144	—	15	18	—	4	—	—	5	1	—	43	3·7	—	5	1	1	—	—	5	12	1·0	134	11·5
Hammersmith	117,965	—	8	12	—	8	—	—	5	—	—	33	3·6	—	5	—	1	1	1	—	8	0·9	96	10·6
Fulham	149,428	—	14	13	—	1	—	—	—	1	—	29	2·5	—	—	—	1	3	—	6	10	0·9	98	8·5
Chelsea	57,298	—	1	7	—	—	—	2	—	—	—	10	2·3	—	—	—	—	1	—	3	4	0·9	48	10·9
City of Westminster	132,853	—	4	14	—	—	—	—	2	—	—	20	2·0	—	—	—	—	—	—	1	1	0·1	104	10·2
North Districts:																								
St. Marylebone	98,573	—	6	7	—	—	—	—	6	—	—	19	2·5	—	—	—	—	—	—	—	—	—	81	10·7
Hampstead	81,470	—	6	10	—	—	—	—	3	—	—	19	3·0	—	2	—	—	—	1	1	4	0·6	61	9·8
St. Pancras	196,812	—	17	36	—	2	—	—	9	—	—	64	4·2	—	4	—	4	2	—	4	14	0·9	178	11·8
Islington	309,359	—	32	39	—	—	—	—	5	1	—	77	3·2	—	12	—	2	3	—	—	17	0·7	260	11·0
Stoke Newington	49,776	—	1	7	—	—	—	—	1	—	—	9	2·4	—	—	—	1	1	—	2	5	0·5	48	12·6
Hackney	209,636	—	17	17	—	2	—	1	8	2	—	47	2·9	—	4	1	1	3	—	4	13	0·8	153	9·5
Central Districts:																								
Holborn	38,161	—	3	7	—	—	—	—	—	—	—	10	3·4	—	—	—	—	—	—	—	—	—	40	13·7
Finsbury	74,230	—	3	6	—	—	—	—	—	—	—	9	1·6	—	3	—	—	1	—	2	6	1·1	70	12·3
City of London	20,113	—	1	—	—	—	—	—	1	—	—	2	1·3	—	—	—	—	—	—	—	—	—	8	5·2
East Districts:																								
Shoreditch	99,932	—	7	13	—	1	—	—	5	—	—	26	3·4	—	3	1	—	—	—	2	6	0·8	101	13·2
Bethnal Green	115,562	—	22	11	—	—	—	1	3	1	—	38	4·3	—	2	—	1	—	1	2	6	0·7	96	10·8
Stepney	258,395	—	18	46	—	4	—	1	10	—	1	80	4·0	—	8	—	2	3	—	7	20	1·0	218	11·0
Poplar	155,095	—	18	23	—	3	—	1	4	1	—	50	4·2	—	5	—	5	4	1	4	19	1·6	137	11·5
South Districts:																								
Southwark	177,166	—	18	38	—	1	—	—	4	1	—	62	4·6	—	4	—	5	1	2	7	19	1·4	208	15·3
Bermondsey	113,661	—	25	21	—	—	—	—	4	1	—	51	5·8	—	—	—	2	—	2	2	6	0·7	111	12·7
Lambeth	283,729	—	14	28	—	4	—	—	10	1	—	57	2·6	—	5	1	4	—	2	4	16	0·7	247	11·3
Battersea	159,402	—	17	18	—	2	—	—	2	—	—	39	3·2	—	4	—	1	3	1	3	12	1·0	121	9·9
Wandsworth	310,858	—	41	42	—	6	—	—	8	1	1	99	4·2	—	1	1	—	2	—	2	6	0·3	209	8·8
Camberwell	249,749	—	32	29	—	3	—	1	5	2	—	72	3·8	—	5	—	2	4	—	3	14	0·7	224	11·7
Deptford	107,696	—	1	29	—	1	—	1	7	—	—	39	4·7	—	8	—	—	—	—	2	10	1·2	114	13·8
Greenwich	94,452	—	35	29	—	1	—	1	5	—	—	71	9·8	—	2	—	2	1	—	2	7	1·0	82	11·3
Lewisham	162,901	—	13	14	—	1	—	—	3	1	—	32	2·6	—	—	—	1	—	—	3	4	0·3	105	8·4
Woolwich	130,313	—	5	17	—	—	—	—	2	—	—	24	2·4	—	1	—	1	1	—	2	5	0·5	89	8·9
Port of London	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

lation exceeding 4,000,000 persons, the death-rate was 10·7, or 0·4 per 1000 above that recorded in the previous week; among the remaining towns the death-rates ranged from 3·2 in Ealing, 5·6 in Cambridge, and 5·5 in Edmonton, to 19·7 in Southend-on-Sea, 23·3 in Huddersfield, and 21·1 in Dewsbury. The principal epidemic diseases caused 338 deaths, which corresponded to an annual rate of 1·0 per 1000, and included 200 from infantile diarrhœa, 55 from measles, 34 from whooping-cough, 28 from diphtheria, 11 from scarlet fever, 9 from enteric fever, and 1 from small-pox. The deaths from diarrhœa, which had increased from 53 to 180 in the four preceding weeks, further rose to 200, and included 60 in London, 21 in Liverpool, 11 in West Ham, and 9 each in Manchester and Leeds. The fatal case of small-pox belonged to Smethwick. The 627 cases of scarlet fever and 1062 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 6 and 9 below the numbers remaining at the end of the previous week. Of the 3412 deaths from all causes in the 96 towns 144 resulted from violence. The causes of 37 deaths were uncertified, of which 4 were recorded in Stoke-on-Trent, in Birmingham, and in Liverpool, and 3 in Leicester, but not one in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at 2,500,000 persons, the annual death-rate was 11·7, against 10·8 and 11·2 per 1000 in the two preceding weeks. The 289 deaths in Glasgow corresponded to an annual rate of 12·6 per 1000, and included 29 from infantile diarrhœa, 8 from whooping-cough, 2 from measles, and 1 from diphtheria. The 88 deaths in Edinburgh were equal to a rate of 13·8 per 1000, and included 2 from diphtheria and 1 from whooping-cough.

Irish Towns.—The 108 deaths in Dublin corresponded to an annual rate of 14·1 per 1000, and included 22 from infantile diarrhœa and 1 from diphtheria. The 85 deaths in Belfast were equal to a rate of 11·3 per 1000, and included 5 from infantile diarrhœa and 1 from whooping-cough.

(Week ended August 25th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 10·6, against 10·3, 10·4, and 10·5 per 1000 in the three preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 10·5, or 0·2 per 1000 less than in the previous week; among the remaining towns the death-rates ranged from 3·8 in Wimbledon, 4·5 in Eastbourne, and 5·2 in Carlisle, to 16·9 in York, 17·3 in Tynemouth, and 20·9 in Stockton-on-Tees. The principal epidemic diseases caused 411 deaths, which corresponded to an annual rate of 1·3 per 1000, and included 274 from infantile diarrhœa, 66 from measles, 30 from whooping-cough, 27 from diphtheria, 10 from enteric fever, and 4 from scarlet fever. The deaths from diarrhœa, which had increased from 53 to 200 in the five preceding weeks, further rose to 274, and included 72 in London, 40 in Liverpool, 22 in Manchester, and 16 in Leeds. The 614 cases of scarlet fever and 1063 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 13 below and 1 above the numbers remaining at the end of the previous week. Of the 3463 deaths from all causes in the 96 towns, 135 resulted from violence. The causes of 23 deaths were uncertified, and included 6 in Birmingham, 3 in Liverpool, and 2 each in Stoke-on-Trent and Manchester.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was 10·3, against 11·2 and 11·7 per 1000 in the two preceding weeks. The 245 deaths in Glasgow corresponded to an annual rate of 11·4 per 1000, and included 32 from infantile diarrhœa, 9 from whooping-cough, 5 from measles, and 2 from diphtheria. The 46 deaths in Edinburgh were equal to a rate of 7·2 per 1000, and included 1 from scarlet fever.

Irish Towns.—The 149 deaths in Dublin corresponded to an annual rate of 19·5, or 4·4 per 1000 above that recorded in the previous week, and included 38 from infantile diarrhœa and 1 each from enteric fever, whooping cough, and diphtheria. The 87 deaths in Belfast were equal to a rate of 11·5 per 1000, and included 7 from infantile diarrhœa.

IRISH VITAL STATISTICS FOR 1916.—During 1916 the marriage-rate in Ireland (5·45 marriages per 1000 of the population) was 0·44 per 1000 under that for 1915 and 0·11 under the average for the 10 years 1906–15. The birth-rate (21·1 per 1000 of the population) was 0·9 per 1000 under the rate for 1915 and 1·9 under the average for the 10 years 1906–15, and is the lowest ever recorded in Ireland. The death-rate was 16·46 per 1000, being 1·10 under the rate for 1915 and 0·55 under the average for the 10 years 1906–15. With the exception of the rate for 1912, which was 16·45, and that for 1914 (16·28), the death-rate is the lowest since 1871. Turning to tuberculosis, the death-rate was for all forms of the disease 2·15 per 1000. With the exception of 1912 (in which the rate was also 2·15), 1913 (2·14), and 1914 (2·07), the rate for 1916 was the lowest recorded in Ireland, but there is little to boast of when we consider that in the same year in England and Wales the mortality rate from consumption in all its types was 1·53 per 1000 and in Scotland 1·59. The infantile mortality was in Ireland during 1916 83 per 1000 births, being 9 under the rate (that is, per 1000 births) for 1915, and also 9 under the average for the 10 years' period 1906–15. The rate, it is satisfactory to know, is the lowest yet recorded. The satisfactory features in the vital statistics for 1916 in Ireland are the low death-rate generally, the fall in the tuberculosis mortality, and the slight improvement in the annual holocaust of infants, but it is most extraordinary to find that in Ireland—of all countries—there was during 1916 the lowest birth-rate yet recorded, and that never were there so few marriages in Ireland as in 1916, notwithstanding that no one ever remembers the country so prosperous, and that, owing to the absence of compulsory service, so few men—that is in comparison with England and Scotland—went to the war.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:

Surgery.—J. L. D. Buxton (Sections I. and II.), University College Hospital, and S. G. Mahomed, Liverpool.

Medicine.—G. S. Ashby (Sections I. and II.), King's College Hospital; J. Behesnilian (Section I.) and C. G. Bunn (Section I.), Charing Cross Hospital; E. F. Deacon (Section I.), Guy's Hospital; F. C. M. Gabites (Sections I. and II.), Edinburgh; I. Liberman (Sections I. and II.), Leeds; A. G. Curzon Miller (Section I.), Middlesex Hospital; and L. Zarchi (Section I.), Petrograd and Royal Free Hospital.

Forensic Medicine.—B. A. M Henderson, Manchester and Charing Cross Hospital; I. Liberman, Leeds; and G. L. Mitchell, Glasgow and Birmingham.

Midwifery.—D. A. Dyer, St. George's Hospital; B. A. M. Henderson, Manchester and Charing Cross Hospital; I. Liberman, Leeds; and J. Stephen, Manchester.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: W. Fletcher Barrett, St. George's Hospital; C. A. W. Chapman, Sheffield; D. C. Clark, King's College Hospital; E. W. Diggett, Jefferson College, Philadelphia; A. Selby Green, Middlesex Hospital; D. E. Hearn, Durham; E. J. G. Sargent, St. Bartholomew's Hospital; C. Segal, Berne and Birmingham; and G. R. Sharp, London Hospital.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee, held on August 14th, 29 cases were considered and £306 voted to 25 of the applicants. The following is a summary of some of the cases relieved:—

Widow, aged 59, of L.R.C.P. Edin. who practised at High Wycombe and Holt and died in June, 1917, and was an annuitant of the Fund. Applicant's only income is £1 per week, and owing to the long illness of her husband requiring constant nursing her health is undermined and she requires a change. Voted £10 in two instalments.—M.D. Lond., aged 50, who practised in London and Perth, South Australia. Applicant has suffered from paralysis for the last ten years. His wife is in a home and her income is only sufficient for herself and for the education of the two children, ages 16 and 17. Applicant's income £50 a year, which he finds insufficient owing to the increased cost of food. Voted £26 in 12 instalments.—Daughter, aged 36, of M.R.C.S. Eng. who died in 1887. Applicant has had to look after her mother, who has recently died, and her income was only a life annuity, so the daughter is left entirely without means, and now wants help to be trained for secretarial work. Voted £10.—Children, twins aged 5 years, of an M.D. Edin. who died in 1916, and the mother in 1914. There is also a boy aged 7, but the grandmother has adopted him. Help is required towards the keep of the twins, who are at present with an uncle who cannot afford to keep them. Voted £12 in 12 instalments.—Widow, aged 39, of M.B. Edin. who practised in South Africa and was killed in action in September, 1916. He came over to England soon after the war commenced, hoping to be able to join the R.A.M.C. or the Red Cross Society, but had to wait so long that he joined a London Regiment as a private. He left his wife and two children, ages 8 and 9, in South Africa. With the exception of what she can earn (at present is acting as temporary housekeeper), her only income is 18*s.* 6*d.* per week pension. She wants some help towards the education of the children. Voted £20.—M.R.C.S. Eng., a widower, aged 72, who practised at Stoke Newington and Ealing. Suffers greatly from bronchitis and some time ago fractured his femur, and has lost the use of his legs. Only income £30 a year from investments. Has two sons unable to help, and lives with a married daughter, whose husband is in the Army. Voted £26 in 12 instalments.—Widow, aged 62, of M.B. Edin. who practised at Brighton and died in April, 1917, at the age of 58, after a long illness which prevented him from saving. Applicant's only income about £50 a year from investments. Has two daughters, both living at home, one a typist and the other a violinist, neither of whom is earning much. One son, married, and is in the Army. Relatives help to pay the rent. Voted £11.—L.R.C.P. & S. Glasg., married, aged 44, who practised at Brighton. Is suffering from tuberculosis and is at present in a sanatorium. Has had nine years' illness, and his savings are exhausted. His wife has just commenced a business, but is unable to help. Voted £26 in 12 instalments.—Daughters, ages 58 and 50, of M.D. Aberd. who practised at Luddenden and died in 1907. Both suffer from chronic deafness and ill-health. Only income £20 each from dividends. Relieved four times, £86. Voted £18 in 12 instalments.—Daughter, aged 36, of M.D. Dub. who practised at Hillingdon and British Guiana and died in 1884. Applicant suffers from tuberculous glands and is unable to work. She lives with her stepmother who is badly off. Relieved nine times, £100. Voted £10 in two instalments.—Widow, aged 60, of L.R.C.P. & S. Glasg. who practised at Walsall and died in 1902. Applicant was left totally unprovided for at husband's death, with daughters to educate. They are both earning a little now, but not sufficient to enable them all to live without help. Applicant earns a little by needlework. Relieved 11 times, £118. Voted £12 in 12 instalments.—Daughter, aged 67, of M.R.C.S. Eng. who practised at Liverpool and died in 1851. Applicant lost all her property in an Australian bank failure. She has very bad health, and is entirely dependent upon friends for support. Relieved four times, £48. Voted £12 in 12 instalments.—Widow, aged 50, of M.R.C.S. Eng. who practised at Bawtry and died in 1906. Applicant's health is very bad, and she has undergone several operations. Only certain income £22 from dividends. Has one daughter who is at the Drapers' Company School. Brother helps with the rent. Relieved once, £10. Voted £10 in two instalments.—Widow, aged 53, of L.R.C.P. & S. Edin. who practised at Blackpool and died in 1912. Applicant was left without means, and tried to earn a living by keeping a boarding house, but owing to ill-health was compelled to give it up, and has the house on her hands until September. Only income £30 a year from a friend. Relieved once, £5. Voted £5.—Daughter, aged 52, of M.R.C.S. Eng. who practised at Kingscliffe and died in 1890. Applicant's income from dividends is £21. She earns £14 a year as a companion. Health very unsatisfactory. Relieved twice, £14. Voted £9 in 12 instalments.

—Daughter, aged 55, of M.R.C.S. Eng. who practised at Kingscliffe and died in 1890. Income from dividends is £21, and is earning at present at the rate of £16 a year as a companion, but was out of employment for some time. Relieved twice, £14. (Sister to the previous applicant.) Voted £9 in 12 instalments.—Daughter, aged 70, of L.S.A. Lond. who practised at Christchurch and died in 1880. Applicant is an artist, but owing to failing sight and age is unable to follow her profession. Has life interest in a house, but owing to its bad state of repair unable to let it. Has recently sold a small cottage, but it only realised £100 net. Friends allow her £25 per annum, and the Artists' Benevolent Fund have made her a grant this year of £15. Relieved once, £18. Voted £18 in 12 instalments.—Widow, aged 65, of M.D. Glasg. who practised at Pollokshields and died in 1908. Applicant has tried to make a living by taking in boarders, but not successfully. Has two small pensions from other charities. Lives in own house which is heavily mortgaged, and which she cannot sell. Relieved three times, £36. Voted £12 in 12 instalments.—Widow, aged 56, of M.R.C.S. Eng. who practised at Dover and died in 1916. Applicant left without means, with two children, ages 17 and 15, and has to assist to support her mother-in-law, aged 87. The children are being educated by friends. Applicant has now obtained a post as district nurse at £70, but finds this not sufficient. Relieved once, £10. Voted £10.—Daughter, aged 63, of M.D. Edin. who practised in London and died in 1859. Applicant has no private means, but earns about £12 a year by needlework. Owing to age she cannot earn more. Relieved nine times, £61. Voted £12 in 12 instalments.

Subscriptions may be sent to the acting Honorary Treasurer, Dr. Samuel West, at 11, Chandos-street, Cavendish-square, London, W. 1.

LITERARY INTELLIGENCE.—Messrs. Cassell and Co. announce the forthcoming appearance of a sixth edition of "Diseases of the Skin," by Sir Malcolm Morris, revised by the author, with the assistance of Dr. Ernest Dore. The chapters on syphilis have been expanded with a view to the needs of those who are carrying out the new official scheme for the diagnosis and treatment of venereal diseases.

PROPOSED AMENDMENT OF THE NATIONAL INSURANCE ACT.—In reply to a recent question by Mr. Sherwell in the House of Commons, Sir E. Cornwall stated that a Bill had been prepared, after discussion with the Advisory Committee to the Insurance Commissioners, dealing with the simplification of administration and with the adjustment of the finance of national health insurance on the lines of the recommendations contained in the reports of the Departmental Committee. He hoped that the Bill might be regarded as non-controversial, and in that event the Government hoped to submit it to Parliament with a view to its passage into law in the course of the autumn session.

Colonel Charles Gordon Watson, C.M.G., F.R.C.S., A.M.S., and Mr. William Edward Audland, L.R.C.P. Lond., M.R.C.S. Eng., have been promoted to Knights of Grace in the Order of the Hospital of St. John of Jerusalem in England.

Obituary.

WILLIAM HENRY SYMONS, M.D. BRUX., D.P.H.

THE death occurred on August 25th, at the age of 63, of Dr. W. H. Symons, medical officer of health for the city of Bath. Dr. Symons trained first as a chemist, becoming analyst to a firm of aerated water manufacturers, and acquiring a considerable practice as a consulting chemist. He was appointed examiner in chemistry under the Pharmacy Act, and held for a time the appointment of assistant demonstrator in materia medica at St. Bartholomew's Hospital. He then decided to qualify in medicine in order to take up public health work, and entering as a student at St. Bartholomew's Hospital he took the Conjoint Diploma in 1894, followed by the Public Health Diplomas at Oxford and Durham. In 1896 he was elected medical officer of health of Bath in succession to the late Dr. A. B. Brabazon, and during his 20 years' tenure of office he entered with the greatest enthusiasm into the work of the health department. He was a pioneer in the campaign against the fly peril, and his work in connexion with child welfare bore good fruit. He instituted a service of municipal midwives, and just before his death organised a very successful Baby Week Exhibition.

CHARLES WADE, M.R.C.S., L.R.C.P.,

MEDICAL OFFICER OF HEALTH FOR THE BOSCASTLE DISTRICT.

Mr. C. Wade died suddenly from syncope on August 7th, in his fifty-third year. The deceased, who belonged to an old Cornish family, succeeded to his late father's practice in Boscastle. He was medical officer of health, also medical officer and public vaccinator for the Boscastle district of the Camelford Union. Mr. Wade had practised in Boscastle for about 30 years, where he was highly esteemed, and took an active interest in all local matters connected with the improvement and welfare of his native town. He will be greatly missed in the district, and much sympathy is felt locally for his widow and daughter.

JOHN BELL FISHER, M.D. EDIN., D.P.H.

THE death occurred suddenly at Liverpool from heart failure of Dr. J. B. Fisher, aged 60 years, who was for more than 30 years health officer to the Whitehaven rural district council, as well as to the Town and Harbour Trustees. He was the son of a veterinary surgeon in Whitehaven and studied at Edinburgh University, where he took his degree in 1880. As a hygienist Dr. Fisher was courteous and persistent in what he regarded as right; he was specially active in his attempts to improve housing conditions, and latterly in the scheme for maternity and child welfare. He was also school medical officer, and presided at several committees, among them the Border Counties Branch of the British Medical Association and the County Medical Committee under the Insurance Act. Dr. Fisher leaves a widow, a son, and a daughter.

WILFRID JAMES HUSSEY PINNIGER, M.D., B.S. LOND., M.R.C.S., L.R.C.P.

Dr. W. J. H. Pinniger died at his residence in Clifton, Bristol, on August 4th, in his thirty-fifth year, from pulmonary tuberculosis. The deceased was the son of the late Mr. T. L. Pinniger, of Beckhampton, Wilts. He received his medical education at Bristol and also studied at King's College and University College, London. He obtained scholarships at the Bristol Medical School, and was a gold medallist at University College, Bristol. He held several resident appointments at the Bristol General Hospital, and was also formerly house surgeon at the Jessop Hospital for Women, Sheffield. He leaves a widow and three children.

CHARLES BAINBRIDGE RENDLE, M.R.C.S., L.S.A., J.P.

Mr. C. B. Rendle died recently at his residence in Kensington, in his eighty-second year. The deceased had formerly practised in Liskeard, where he was placed on the commission of the peace for the borough. He later removed to Stoke, Plymouth, and eventually to London. He was the eldest brother of the late Dr. E. M. Russel Rendle, of Plymouth, and his son, Dr. A. R. Rendle, was formerly in practice in Stoke, and another son, Dr. A. B. Rendle, at one time practised in Plymouth.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

COOKE, E. H., M.B., B.S. Durh., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Hendon District of the county of Middlesex.

DUNCAN, A. H. R., L.R.C.P., L.R.C.S.I., Certifying Surgeon under the Factory and Workshop Acts for the Omagh District of the county of Tyrone.

McDOWALL, COLIN, M.D., Medical Superintendent of Ticehurst House, Ticehurst, Sussex.

SAI, P., M.B., B.S. Lond., Medical Officer to Addenbrooke's Hospital, Cambridge.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

APPLECROSS PARISH COUNCIL.—Medical Officer and Public Vaccinator for the Torridon District. Salary £350 per annum, with house, &c.

AYRSHIRE, LOWER DISTRICT OF COLMONELL PARISH.—Medical Officer. Salary £70 per annum.

BARNSLEY, BECKETT HOSPITAL.—Second Female House Surgeon. Salary £200 per annum, with board, &c.

BIRKENHEAD UNION INFIRMARY.—Junior Female Resident Assistant Medical Officer. Salary at rate of £300 per annum, with board, &c.

BOLTON INFIRMARY.—Female Locum Tenens Assistant Surgeon.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BROMSGROVE, WORCESTERSHIRE ASYLUM.—Temporary Assistant Medical Officer.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

CAMBRIDGE, ADDENBROOKE'S HOSPITAL.—House Physician. Salary £150 per annum, with board, &c.

CARLISLE, CUMBERLAND INFIRMARY.—Female House Surgeon for six months. Salary at rate of £250 per annum, with board, &c. Also Female House Physician for six months. Salary at rate of £200 per annum, with board, &c.

COVENTRY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £350 per annum.

CUMBERLAND, COUNTY OF.—Female Assistant Medical Officer. Salary £350 per annum.

DARTFORD, KENT, CITY OF LONDON MENTAL HOSPITAL.—Locum Tenens Medical Officer. Salary 7 guineas per week, with board, &c.
DERBY, DERBYSHIRE ROYAL INFIRMARY.—House Surgeon. Salary £200 per annum, with board, &c.
EASTBOURNE EYE INFIRMARY.—Ophthalmic Surgeon.
EPSOM, LONG GROVE ASYLUM.—Locum Tenens Medical Officer. Salary 6 guineas a week, with board, &c.
HULL, VICTORIA HOSPITAL FOR SICK CHILDREN.—House Surgeon.
MANCHESTER, ANCOATS HOSPITAL.—Honorary Physician to the Skin Department. Salary at rate of 3 guineas per clinic.
MANSFIELD, BOROUGH OF.—Temporary Medical Officer of Health and School Medical Officer. Salary at rate of £500 per annum.
NORTHERN HOSPITAL, Winchmore Hill, N.—Temporary Assistant Medical Officer for Sanatorium Wards. Salary 7 guineas per week, with 30s. allowance in lieu of emoluments.
PORTSMOUTH ROYAL HOSPITAL.—House Surgeon for six months. Salary £250 per annum, with board, &c.
QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician for six months. Salary £100 per annum, with board, &c.
ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150, with board, &c.
ROYAL LONDON OPHTHALMIC HOSPITAL (MOORFIELDS EYE HOSPITAL), City-road, E.C.—Third House Surgeon. Salary at rate of £50 per annum, with board, &c.
ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, E.C.—House Surgeon. Salary at rate of £250 per annum, with board, &c.
SALFORD ROYAL HOSPITAL.—Junior House Surgeon for six months. Salary at rate of £150 per annum, with board, &c.
SALISBURY GENERAL INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.
SHEFFIELD ROYAL INFIRMARY.—Two House Surgeons. Salary £120 per annum, with board, &c.
STAFFORDSHIRE, WOLVERHAMPTON, AND DUDLEY JOINT COMMITTEE FOR TUBERCULOSIS.—Resident Medical Officer for Moxley Sanatorium, near Wednesbury, Staffs, also to assist the Dispensary Medical Officers. Salary £350 per annum, with board, &c.
STOCKPORT INFIRMARY.—Senior House Surgeon. Salary £250 per annum, with board, &c. Also Junior House Surgeon. Salary £200 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Radcliffe (Nottingham), Burton Latimer (Northampton), Pangbourne (Berks), and Whitehaven (Cumberland).

Births, Marriages, and Deaths.

BIRTHS.

BACK.—On August 23rd, at Queen Anne-street, Cavendish-square, the wife of Ivor Back, F.R.C.S., Captain, R.A.M.C.T., of a son.
BAINBRIDGE.—On August 21st, at Tregantle, Torquay, the wife of Surgeon Charles Frederick Bainbridge, R.N., of a daughter.
CRICHTON-MILLER.—At Bowden House, Harrow-on-the-Hill, on August 27th, the wife of H. Crichton-Miller, M.D., of 114a, Harley-street, of a daughter.
HAROLD.—On August 22nd, at Brunswick-square, W.C., the wife of James Harold, L.R.C.P.I., L.M., of a son.
RODERICK.—On August 22nd, at Trumpington street, Cambridge, the wife of Lieutenant-Colonel Henry Buckley Roderick, M.C., M.D., R.A.M.C., of twin sons.

MARRIAGES.

BELL—RAMSBOTHAM.—On August 27th, at The Charterhouse, London, John Henry Montgomerie Bell, M.D. Edin., F.R.C.S. Edin., Captain, C.A.M.C., to Frances Jane, daughter of the late S. H. Ramsbotham, M.D., of Leeds.
GRANT—MINIKIN.—On August 16th, in Edinburgh, Captain John Victor Livingstone Grant, M.B., Ch.B. Edin., R.A.M.C., to Ida Mary, daughter of the late Mr. and Mrs. Minikin, of Horsforth.
MURRAY—BEART.—On August 23rd, at St. George's, Hanover-square, London, James Elliot Murray, M.D. Edin., of Shanghai, China, to Jocelyn Frances, younger daughter of Montague Beart, of Sawbridgeworth, Herts (late of China and Japan).
PERRIN—PRESTON.—On August 22nd, at the Parish Church, Weybridge, Maurice Nasmith Perrin, B.C. Camb., Captain, R.A.M.C., to Susan Frances, youngest daughter of Mr. and Mrs. Walter Preston, of Curlew Hope, Weybridge.
PRACY—POWER.—On August 24th, at St. Mary's, Atherstone, Captain Douglas Sherrin Pracy, R.A.M.C., M.R.C.S. Eng., L.R.C.P. Lond., to Gwendoline Blanche, elder daughter of Dr. E. T. Power, Atherstone.

DEATHS.

ACKROYD.—On August 11th, killed in action, Captain Harold Ackroyd, M.C., R.A.M.C.
ARMITAGE.—On July 30th, whilst attending the wounded, Captain Frank Rhodes Armitage, M.B., D.S.O., R.F.A., aged 34.
BOSTOCK.—On August 17th, at Portman-mansions, W., Surgeon Captain R. Ashton Bostock, Scots Guards, of Penmaen, Glamorgan.
METCALFE.—On August 24th, at 1, Freeman-street, Skelmersdale, Lancs., George Metcalfe, M.D., M.S., B.S., L.R.C.P., M.R.C.S., aged 54.
SEWARD.—On August 15th, at Ashley House, Ryde, I.W., George Edwin Seward, Retired Brigade Surgeon, Indian Army, in his 91st year.
SYMONS.—On August 25th, William Henry Symons, M.D. Brux., D.P.H. Durh., Major, R.A.M.C.T., of Combe Park, Bath, aged 62.
TAYLOR.—On August 25th, at Bexhill-on-Sea, Henry Young Cameron Taylor, M.B., C.M., F.R.C.S. Edin., Captain, R.A.M.C.
TREHERNE.—On August 12th, of wounds received in action, Captain Claude William Treherne, R.A.M.C., aged 23.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE CAUSATION OF SEX.

To the Editor of THE LANCET.

SIR,—Although no one has, up to the present, settled the question when and where in the course of development of the embryo sex is determined, I think it illogical to attribute it merely to that stage when sexual differentiation takes place, and that therefore this factor may be safely eliminated from the field of investigation. Sexual differentiation similar to that of any other part of the entire organism, occurs in due time, but the determination of sex is established at the moment of fertilisation of the ovum, when also the potential development of any other part of the whole is present in the fertilised cell. The settlement of the sexes at this crucial point is, however, only the result of the condition of the spermatozoa and ova before fertilisation, and this condition appears to me to be the true cause of sex.

In previous publications I have stated the results of my observations in 1500 maternity cases, and I am now preparing new tables for further observations based on those results which I hope to publish in due course. As I have stated before, my experience does not agree with any of the various views of previous observers, except perhaps that of Weill, mentioned by your correspondent Dr. Leonard J. Kidd in THE LANCET of August 18th, but Weill does not define the activities of the spermatozoa or ova at the time of fertilisation.

I am, Sir, yours faithfully,
A. P. MURTZ.

Queen's-road, N., August 29th, 1917.

THE FACTORY GIRLS' COUNTRY HOLIDAY FUND.

Mr. Pett Ridge makes an earnest appeal for support in the annual report of the executive committee of this fund. Throughout the year girls and women whose health made a change and rest absolutely imperative have been sent away, and it is clear that under the stress of war holidays have been more needed than ever by the poorer class of worker. The committee of the fund has been faced with great difficulty both in finding the necessary money and in selecting the women who need the holidays most. At the present time the cost of a holiday is more than double the sum it was in normal years. For this reason the committee's appeal for funds to supplement the amount the girls and women can pay has to be more urgent than ever. Subscriptions and donations will be most thankfully received and acknowledged by Miss Canney, 75, Lamb's Conduit-street, London, W.C. 1.

FIRST AID.

A NEW and revised edition of the excellent little manual "Aid to the Injured and Sick," by Henry Willingham Gell, M.B. Oxon., published under the auspices of the National Health Society, 53, Berners-street, W., price 3*d*., has just been issued. Its purpose is to supply in the form of a text-book, at a price within the means of the poorer members of the community, the information necessary for assistance in emergencies "till the doctor comes." To achieve this object much condensation has, of course, been necessary, but clearness has not thereby been sacrificed, and the fact that the little book has gone through 39 editions in 25 years is an indication of its popularity and usefulness. The nine chapters into which the 40 pages of the book are divided deal with anatomy and physiology, wounds, hæmorrhages, fractures, dislocations and strains, bruises, burns, stings and poisons, insensibility, drowning, hanging, suffocation and electric shock, bandaging and the carriage of patients.

PORTLAND CEMENT IN THE DRESSING OF WOUNDS.

To the Editor of THE LANCET.

SIR,—Having been in the habit of using small packets of Portland cement for many years for small household repairs, I have noticed its peculiar effects on the fingers if in its moistened state it is allowed to adhere to them for half an hour or so. It blanches and shrivels the fingers, and bores pin-holes in the tips especially, which tingle until ointment is applied. The faculty of boring these pin-holes particularly interested me, and I had often wondered what the effect would be if Portland cement were applied to a large wound. Several years ago I have a recollection that I read a letter somewhere from a medical man I think, who said he had used it in the treatment of wounds, whether plain or mixed with some other substance, possibly sugar, I cannot quite recall. I have many times tried to find the letter again by means of indexes but have not discovered it. I have also

looked in books published upon the uses of concrete and Portland cement, but have found no mention there of the use of Portland cement in wounds. I have an impression that it was in THE LANCET that I saw the note, but cannot be certain. I have been thinking that perhaps the idea might again turn up in this war, but it has not up to now, so far as I know. Perhaps some of your readers may know of this scouring treatment of wounds.

I am, Sir, yours faithfully,

London, August 24th, 1917. DOMESTICUS.

A SIMPLE METHOD OF DETECTING SIMULATED DEAFNESS.

MEDICAL Boards not infrequently meet with men who state that they are "hard of hearing" in one or both ears, and in a number of these cases the examiner suspects malingering, or at least an exaggeration of their deafness. Dr. John J. Eyre has written to us describing a method of detecting simulation which he has found of practical service as a member of the Shoreditch Medical Board, and is not contained in the standard works on malingering. The usual tests, such as the watch and the tuning-fork, take time and are open to objection, as they depend upon the statement of the subject as to whether he can hear them or not. It occurred to him that the involuntary blinking of the eye might be used as a test applied in the following way. The recruit, who stated that he was very hard of hearing, was first asked which ear was the deafer, and then requested to close it with the index finger of the hand of the same side. Standing on the opposite side, with his face 6–8 inches away from the ear, and after pretending to examine the ear for a few seconds, Dr. Eyre then whispered suddenly, "Shut your eyes." Before the recruit could take thought he closed his eyes and revealed the fact that he was a malingerer. Dr. Eyre suggests that this method may also be employed as a rough-and-ready test for varying degrees of deafness, the voice being gradually raised or the mouth brought nearer to the ear of the subject until the eye reflex is obtained.

ESPERANTO AND THE WAR.

Mr. Bernard Long, of 1, Cromwell-road, Basingstoke, the author, has sent us a pamphlet, *Esperanto and Why We Need It*, in which he makes out a good case for this auxiliary language. Mr. Long sets out the history of Esperanto and the uses to which it has been put socially and commercially, and notes the support that it has received from Government departments and other important bodies throughout the world. The adaptability of Esperanto to scientific use has led to the formation of an Esperanto group of medical men, the Tutmonda Esperantista Kuracista Asocio, which up to the beginning of the war had its own journalistic organ *La Kuracisto*. It is of interest to note that the study of the language has been the means of somewhat ameliorating the conditions of prisoners in internment camps, and in some cases, we are told, Flemish- and French-speaking Belgians are now for the first time able to converse together by means of Esperanto, which they learned in the camp classes. The pamphlet, price 2*d.*, can be obtained from the British Esperanto Association, 17, Hart-street, W.C.1.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

The following journals, magazines, &c., have been received:—British Journal of Ophthalmology, Journal of State Medicine, American Medicine, Pacific Medical Journal, Journal of Nervous and Mental Diseases, American Journal of Orthopedic Surgery, Mexican Review, Pediatrics, Cleveland Medical Journal, Military Surgeon, Man, Clinical Medicine, Therapeutic Gazette.

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IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

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VOLUMES for the first half of the year 1917 are now ready. Bound in cloth, gilt lettered, price 21s., carriage extra.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, August 29th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Aug. 23	...	113	72	62	63	65	Cloudy
,, 24	0·05	111	68	57	58	63	Cloudy
,, 25	...	115	70	55	54	62	Fine
,, 26	...	112	63	55	56	62	Cloudy
,, 27	0·22	100	62	52	54	59	Cloudy
,, 28	0·80	81	61	55	57	60	Cloudy
,, 29	0·10	86	62	54	55	58	Overcast

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

BOOKS, ETC., RECEIVED.

BALE, JOHN, SONS, AND DANIELSSON, London.
Clinical Surgical Diagnosis for Students and Practitioners. By F. de Quervain. Second English edition translated by J. Snowman, M.D. 35s. net.

CHURCHILL, J. AND A., London.
Massage: Its Principles and Practice. By James B. Mennell, M.A., M.D., B.C. Cantab. With an Introduction by Sir Robert Jones, C.B., Colonel, R.A.M.C.
Pathology, General and Special, for Students of Medicine. By R. Tanner Hewlett, M.D., F.R.C.P., D.P.H. Fourth edition. 12s. 6d. net.

KIMPTON, HENRY, London.
Operative Surgery of the Nose, Throat, and Ear. By H. W. Loeb and Others. Vol. XI. (in two volumes). Price £3.

LEWIS, H. K., London.
Electro-Therapeutics for Military Hospitals. By Wilfrid Garton, M.R.C.S., L.R.C.P., Temp. Capt., R.A.M.C. 2s. 6d. net.
The Indian Operation of Couching for Cataract, incorporating the Hunterian Lectures, 1917. By Robert Henry Elliott, Lieut.-Col., I.M.S. (ret.). 7s. 6d. net.
Hygiene and Public Health. By Louis C. Parker, Lieut.-Col., R.A.M.C. (Temp.), and H. R. Kenwood, Lieut.-Col., R.A.M.C. (Temp.). Sixth edition. 14s. net.

LONGMANS, GREEN, AND CO., London.
One Hundred and One Practical Non-Flesh Recipes. By Margaret Blatch, M.C.A. Third edition. 1s. 6d. net.
The Public School System in Relation to the Coming Conflict for National Supremacy. By V. Seymour Bryant, M.A. With a Preface by Lord Rayleigh. 1s. 6d. net.

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